IN THE ENVIRONMENT COURT OF NEW ZEALAND
AUCKLAND REGISTRY

I TE KŌTI TAIAO O AOTEAROA
TĀMAKI MAKAURAU ROHE

IN THE MATTER	**of the Resource Management Act 1991**
AND	**of appeals under clause 14 of Schedule 1 of the Act**
BETWEEN	**CEP SERVICES MATAUWHI LIMITED**
	ROYAL FOREST AND BIRD PROTECTION SOCIETY OF NEW ZEALAND INCORPORATED
	MANGAWHAI HARBOUR RESTORATION SOCIETY INCORPORATED
	NEW ZEALAND REFINING COMPANY LIMITED
	Appellants
AND	**NORTHLAND REGIONAL COUNCIL**
	Respondent

EVIDENCE IN CHIEF OF LISETTE SUSANNE COLLINS ON BEHALF OF CEP SERVICES MATAUWHI LIMITED AND ROYAL FOREST AND BIRD PROTECTION SOCIETY OF NEW ZEALAND (TOPIC 11: BIODIVERSITY - INDIGENOUS BIODIVERSITY MAPPING)

16 OCTOBER 2020

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Introduction, Qualifications and Experience

1. My name is Lisette Susanne Collins. I am the Principal Ecologist at 'Northland Ecology'.

2. I hold the degrees of Bachelor of Science and Master of Science with First class Honours from the University of Waikato. I have been employed by Landcare Research, the Department of Conservation and the Waikato Regional Council and for 16 years I have been an Ecological Consultant in the private sector. I spent 8 years as a Senior Ecologist with Wildland Consultants, a year with RPS Group Australia in Queensland and, since 2013, have been self-employed.

3. I am very experienced with the application of ecological significance criteria to assess natural areas and have undertaken numerous assessments of ecological significance in relation to Assessments of Ecological Effects (e.g. subdivisions, quarries, roads, power supply routes and other infrastructure), proposed covenants, transferrable development rights, restoration plans and urban structure plans.

4. I have contributed to landscape-scale assessments to identify Significant Natural Areas in the Western Bay of Plenty District, Whakatane District, Tauranga City, the coastal environment of the Bay of Plenty Region and Waitomo District, and led a project in New Plymouth District. I am skilled in developing methods, undertaking fieldwork and completing assessments for a range of vegetation and habitat types including sand dunes, gumlands, estuarine wetlands, freshwater wetlands, and lowland forests.

5. I have been engaged by CEP Services Matauwhi Limited and the Royal Forest and Bird Protection Society of New Zealand Incorporated to provide evidence with respect to sites of "High Natural Character" that, in my opinion, meet the criteria for ecological significance in Appendix 5 of the Regional Policy Statement for Northland but which have not been identified as ecologically significant in the Proposed Regional Plan. My evidence provides a summary of three reports in which I assess

sites of “High Natural Character” against the criteria for ecological significance in the Regional Policy Statement for Northland.

6. I have also been asked to provide my opinion on the appropriateness of the reinstatement of the SEA at the Marsden Point and the reduction of the SEA at Mangawhai.

Code of Conduct

7. I have read the Code of Conduct for Expert Witnesses produced by the Environment Court (2014) and undertake to follow it for this hearing. My qualifications as an expert are set out above. Other than those matters identified within my evidence as being from other experts, I confirm that the issues addressed in this brief of evidence are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

Scope of Evidence

8. This evidence is structured as follows:

    a) Executive summary
    b) The criteria for ecological significance in the Regional Policy Statement for Northland
    c) First Report: Uruti Bay Wetland
    d) Second Report: Assessment of the ecological significance of twelve sites of High Natural Character
    e) Third Report: Assessment of the ecological significance of six sites of High Natural Character
    f) Common findings
    g) Outcomes
    h) Using High Natural Character as a proxy for ecological significance
    i) Issues with relying on natural character sites to identify potential SEAs
    j) Extent of SEAs at Marsden and Mangawhai
    k) Conclusions

Executive Summary

7. Appendix 5 of the Regional Policy Statement for Northland ("Appendix 5") provides criteria for assessing and identifying sites of ecological significance. Using these criteria, I undertook three studies to assess the ecological significance of seventeen (17) mapped sites of "High Natural Character" in the Proposed Regional Plan. Only four of the sites are identified in the Proposed Regional Plan as Significant Bird Areas ("SBA"), and none are identified as Significant Ecological Areas ("SEA"). I confirmed that six of the sites meet the Appendix 5 criteria, nine sites probably meet the criteria and the remaining two sites are likely to meet the criteria, subject to further assessment and/or ground-truthing.

8. In the first study, Uruti Bay Wetland was assessed using online data sources, expert advice and field assessment and was found to meet all the criteria in Appendix 5. However, it is not identified as SEA or SBA in the maps that accompany the Proposed Regional Plan.

9. The second document assesses twelve sites of "High Natural Character", including Uruti Bay Wetland. The sites were assessed using only the descriptions and notes included in the natural character worksheet. Ten sites (including Uruti Bay Wetland) probably meet at least one of the Appendix 5 criteria, and the remaining two sites possibly meet at least one criterion. However, only four of the sites are identified as SBA and none are identified as SEA.

10. The final report assesses six sites of "High Natural Character" on the Russell Peninsula, including Uruti Bay Wetland. Descriptions and notes in the natural character worksheets were used in addition to online databases and observations provided by local ecologists and practitioners. All of the sites meet at least one Appendix 5 criterion but none are identified as SBA or SEA.

11. From these investigations it appears that the Appendix 5 criteria for ecological significance in the Regional Policy Statement have not been applied to all natural

areas or that they have not been applied consistently. As a consequence, many areas with significant ecological values that meet Appendix 5 criteria have not been assessed or identified in the Proposed Regional Plan. In my opinion "High Natural Character" can be used to address at least some of these omissions.

Criteria for ecological significance

12. Appendix 5 to the Regional Policy Statement for Northland sets out criteria for assessing ecological significance and states that a site is ecologically significant if it meets one of four criteria[1]. The four criteria are: 1. Representativeness, 2. Rarity / distinctiveness, 3. Diversity and pattern, and 4. Ecological context. Each of these criteria are divided into sub-criteria.

13. The criteria are absolute and without degree. There is no ranking system or any requirement for a site to meet any combination of the criteria. According to the Regional Policy Statement for Northland, if a site meets one of the sub-criteria it is ecologically significant.

14. Method 4.4.3(1) of the Regional Policy Statement directs the Regional Council to apply Appendix 5 to "water bodies (including wetlands), in, on, or under the beds of rivers and lakes, and in the CMA" (my emphasis). In my opinion, all of the Appendix 5 criteria are applicable to terrestrial, freshwater and coastal sites. However, one of the sub-criteria is generally applicable only to sites (or parts of sites) above the level of mean highwater spring[2], and one is applicable only to marine areas[3] Another of the sub-criteria[4] specifically includes both estuarine (i.e. intertidal) and palustrine (i.e. freshwater) wetland types.

[1] Attachment 1
[2] Criterion 2(a)(i), relates to Threatened Land Environments and
[3] Criterion 2(d)(iv), relates to rare habitat as recognised in the NZ Marine Protected Areas Policy.
[4] Criterion 2(a)(iii) specifies wetland types including saltmarsh (and estuarine wetland type) and a further five wetland types that occur above the level of mean highwater spring.

First Report: Uruti Bay Wetland

15. In August 2019 CEP Services Matauwhi Ltd engaged me to assess the ecological significance of Uruti Bay Wetland, a site on the Russell Peninsula in the eastern Bay of Islands[5]. Uruti Bay Wetland is mapped and identified in the Proposed Regional Plan as a site of "High Natural Character" but is not identified as a SEA or a SBA.

Methods

16. To complete the assessment, existing ecological information about Uruti Bay Wetland was compiled and reviewed. Practitioners associated with local projects (i.e. Russell Kiwi Protection, Annual Kiwi Call Count Monitoring) and local conservation groups (i.e. Russell Landcare, Living Waters Bay of Islands) were consulted regarding fauna. A site inspection was undertaken to map and describe the vegetation and habitat types.

Vegetation and habitats

17. The natural character assessment worksheet provided by Northland Regional Council describes the vegetation within Uruti Bay Wetland as comprising mangroves, oioi saltmarsh and raupo-dominated freshwater wetland. Values that contributed to the natural character status of the site were: "Largely indigenous vegetation with few pest plants. Continuum mangroves, saltmarsh to freshwater wetland. Part of a continuum of marine to terrestrial ecosystems. Part of community pest control area".

18. My assessment of Uruti Bay Wetland is consistent with the descriptions in the natural character worksheet. I mapped three main vegetation and habitat types: mangroves occupy *c.*5.3 ha (*c.*4.4. hectares of which is within the Coastal Marine Area), oioi-dominated saltmarsh comprises *c.*0.5 ha, and raupo-dominated freshwater wetland extends over *c.*1.9 ha. These vegetation types grade into each other and there are patches of saltmarsh within both the mangroves and the raupo wetland. Invasive plants are largely confined to the margins of the wetland. The raupo wetland in the

[5] Attachment 2

eastern arm of Uruti Bay Wetland extends beyond the boundary of the mapped site, covering a further *c.*0.75 ha.

Avifauna

19. Uruti Bay Wetland is habitat for common bird species, two 'threatened' species and five 'at risk'[6] species, as listed in Table 1. In addition, it may be a habitat of 'at risk' species of shag (*Phalacrocorax* spp.) and/or kotuku (white heron, *Ardea modesta*). Kotuku is classified 'Threatened - Nationally Critical' and have been observed feeding on the intertidal flats of Uruti Bay but have not been recorded within the mapped site.

Table 1: 'Threatened' and 'at risk' bird species for which Uruti Bay Wetland provides habitat.

Threat Status	**Species**
Threatened - Nationally Critical	Australasian bittern/Matuku (*Botaurus poiciloptilus*)
Threatened - Nationally Vulnerable	Caspian tern (*Hydroprogne caspia*)
At Risk - Declining	Banded rail (*Gallirallus philippensis*)
	Spotless Crake/Pūweto (*Porzana tabuensis*)
	Fernbird/Matata (*Bowdleria punctata*)
	North Island Brown Kiwi (*Apteryx mantelli*)
At Risk - Recovering	Weka (*Gallirallus australis greyi*)

Fish

20. Freshwater fish recorded in Uruti Bay Wetland include redfin bully (*Gobiomorphus huttoni*), common bully (*Gobiomorphus cotidianus*), Cran's bully (*Gobiomorphus basalis*), shortfin eel (*Anguilla australis*) and a large population of banded kokopu (*Galaxias fasciatus*). Fish species observed in the estuarine portion of the site include yellow-eyed mullet (*Aldrichetta forsteri*), snapper (*Pagrus auratus*), kahawai (*Arripis trutta*), goatfish (*Upeneichtys* sp.), spotties (*Notolabrus celidotus*), parore (*Girella tricuspidata*) and flounder (*Rhombosolea* spp.).

[6] Threat classifications for avifauna follow Robertson H.A., Baird, K., Dowding J.E., Elliott G.P., Hitchmough R.A., Miskelly C.M., McArthur N., O'Donnell C.F.J., Sagar P.M., Scofield R.P., Taylor G.A. 2017. Conservation status of New Zealand birds, 2016. *New Zealand Threat Classification Series 19. Wellington, Department of Conservation. 27*p.

Reptiles

21. Auckland green gecko (elegant gecko, *Naultinus elegans*) have been sighted in manuka and kanuka within two metres of the raupo wetland. This species is classified 'At Risk-Declining'[7].

Ecological Significance

22. In my opinion, Uruti Bay Wetland, as defined by the mapped site of "High Natural Character", meets all four of the Appendix 5 criteria for ecological significance. A site needs to meet only one of the criteria to be regarded as ecologically significant. As such, in my opinion it would be appropriate for Uruti Bay Wetland to be included as a SEA in the Proposed Regional Plan. Mr Vince Kerr concurs - his recommendations in response to this study and my second and third studies are discussed in paragraphs 30-40, below.

Second Report: Assessment of twelve sites of High Natural Character

Purpose and methods

23. CEP Services Matauwhi Ltd then engaged me to undertake a desktop assessment of twelve sites of "High Natural Character"[8] to investigate the usefulness of the natural character worksheet for assessing ecological significance. The sites were selected to provide a geographical spread across Northland. Nine sites are on the east coast, extending from Mangonui in the North to Mangawhai in the South, including Uruti Bay Wetland. The remaining three sites are on the west coast. Nine sites are within the CMA, two sites are largely within the CMA and one site is outside the CMA. Four of the sites are identified as SBA but none are identified as SEA

24. The natural character worksheet takes the form of an Excel spreadsheet that scores each site against each of the natural character variables that contribute to the overall Natural Character Index. It also provides a brief description of each site and

[7] Hitchmough R., Barr B., Lettink M., Monks J., Reardon J., Tocher M., van Winkel D. and Rolfe J. 2016: Conservation status of New Zealand reptiles, 2015. *New Zealand Threat Classification Series 17*. Department of Conservation.

[8] Attachment 3

describes the values that contribute to its natural character ranking. These notes were used to assess each site against the Appendix 5 criteria for ecological significance.

25. To determine the usefulness of the natural character worksheet for assessing ecological significance, I undertook the assessments without referring to other data-sources, such as aerial photographs. I used the worksheet to identify which criteria each site "probably" or "possibly" meets. Other data sources and/or ground-truthing would be required to confirm if a site definitely meets the criteria.

Findings

26. The natural character worksheet contained information to indicate ten (10) of the twelve (12) sites probably meet at least one of the Appendix 5 criteria for ecological significance. Two sites possibly meet the criteria.

27. Criterion 1 (Representativeness) includes a sub-criterion that requires consideration of the indigeneity of the vegetation and habitats and their similarity to that which would have existed around 1840. Ten (10) sites were assessed as probably meeting this criterion because they are described in the natural character worksheet as "largely indigenous", "close to present potential cover" and/or including a "combination of vegetation and habitat and a good example of its type". The remaining two sites were assessed as possibly meeting this criterion.

28. Criterion 2 (Rarity and distinctiveness) could not be assessed using the natural character worksheet because the required information was beyond the scope of the natural character assessments. Further desktop assessments could be undertaken to assess sites against part of this Criterion, particularly in relation the extent of wetland vegetation types, such as saltmarsh and swamp (e.g. raupo wetland).[9]

[9] Criterion 2a states that a site is significant if it includes a) Saltmarsh greater than 0.5 hectare in area; or b) Shallow water (lake margins and rivers) greater than 0.5 hectare in area; or c) Swamp greater than 0.4 hectare in area; or d) Bog greater than 0.2 hectare in area; or e) Wet Heathlands greater than 0.2 hectare in area; or f) Marsh; Fen; Ephemeral wetlands or Seepage / flush greater than 0.05 hectares in area.

29. Criterion 3 (Diversity and pattern) could be assessed for some sites where the natural character worksheet states they include a “sequence” or “continuum” of vegetation and habitat types. Six sites, including Uruti Bay Wetland, were assessed as probably meeting this criterion.

30. It is at least possible (and reasonably probable) that all of the sites meet Criterion 4 (Ecological context) because they comprise or provide a link to mangroves, estuarine wetlands and freshwater wetlands. These habitats:

    - buffer the marine habitat from sediment and stormwater runoff from land.
    - buffer terrestrial habitats from storm surges.
    - are associated with stream mouths, intertidal channels and wetlands that may be critical to the life history of native, migratory freshwater fish.

Conclusions

30. The natural character worksheet was useful for identifying sites that may meet the Appendix 5 criteria for ecological significance. It enables some aspects of Criterion 1 (Representativeness) and Criterion 3 (Diversity and pattern) to be assessed. It does not enable Criterion 2 (Rarity/distinctiveness) to be assessed and does not provide information specific to Criterion 4 (Ecological Context).

31. If sites of potential ecological significance are to be assessed using the natural character worksheet, the information in the worksheet needs to be supplemented with data from other sources to enable a more comprehensive and accurate assessment against the Appendix 5 criteria. At least a sample of the sites will require ground-truthing to address information gaps, check the accuracy of the methods being used and refine them, as necessary.

Third Report: Assessment of six sites of High Natural Character

32. Following completion of the assessments using only the natural character worksheet, CEP Services Matauwhi Ltd engaged me to assess a further six sites of "High Natural Character"[10]. The purpose of this study was to determine if the natural character assessment worksheet in combination with aerial photographs, Threatened Land Environments Classification and information provided by local fauna practitioners, can be used to undertake more complete assessments against the Appendix 5 criteria for ecological significance than using the worksheet alone. Site inspections were not undertaken[11].

33. Six sites of "High Natural Character" at five locations on the Russell Peninsula were assessed, including one site that was assessed in the previous study: Uruti Bay Wetland. Four of the six sites are entirely or largely within the Coastal Marine Area (CMA). One site is partially within the CMA and one lies outside the CMA. The five sites within or partially within the CMA include mangrove habitats in combination with saltmarsh and/or palustrine wetlands. None of the sites are identified as SBA or SEA in the Proposed Regional Plan.

Findings

34. All six sites were assessed against each of the Appendix 5 criteria using the natural character worksheet, online data sources and information from local practitioners. All of the sites were found to meet the criteria.

35. Consistent with the previously described study, the natural character worksheet provided information that enabled sites to be assessed against Criterion 1 (Representativeness), in relation to the indigeneity of the vegetation and habitats and their similarity to that which would have existed around 1840, and Criterion 3 (Diversity and pattern) in relation to ecological sequences.

[10] Attachment 4
[11] A site inspection of Uruti Bay Wetland was undertaken for the first study.

36. Criterion 2 (Rarity / distinctiveness) was assessed using aerial photographs and the fauna and flora information provided by local practitioners. Local practitioners provided information about 'threatened' and 'at risk' avifauna and Northland endemics. Aerial photographs were used to estimate the extent of wetland vegetation types and determine if the minimum threshold areas were exceeded[12]. Threatened Land Environment Classification was less useful because the mapping does not extend below the level of Mean High Water Springs.

37. Criterion 3 (Diversity and pattern) was also assessed using aerial photographs and fauna information provided by local practitioners. These sources enabled assessments to be made of the diversity of species and vegetation types present.

38. Criterion 4 (Ecological context) was assessed using fauna information to identify habitat for critical life stages of fauna species. The other components of this criterion were assessed with regard to the assessment sheets for "Significant Ecological Areas" that are available on the Northland Regional Council's GIS portal, accompanying the Proposed Regional Plan maps. The sheet for each SEA includes a table that assesses ecological significance using a slightly different set of criteria to those included in Appendix 5. They explicitly exclude an assessment of 'threatened', 'at risk' and endemic species, but do include an assessment of Criterion 4. Therefore, they were used as a guide to assess the six sites in this study against Criterion 4 in a way that is consistent with how it was applied to mapped SEA in the Proposed Regional Plan.

Common Findings

39. In these three studies I applied the Appendix 5 criteria for ecological significance to seventeen (17) sites of "High Natural Character". Eleven sites were assessed using only the natural character worksheet. Five sites were assessed using the natural character worksheet, other online data sources and advice from local practitioners.

[12] Criterion 2a states that a site is significant if it includes a) Saltmarsh greater than 0.5 hectare in area; or b) Shallow water (lake margins and rivers) greater than 0.5 hectare in area; or c) Swamp greater than 0.4 hectare in area; or d) Bog greater than 0.2 hectare in area; or e) Wet Heathlands greater than 0.2 hectare in area; or f) Marsh; Fen; Ephemeral wetlands or Seepage / flush greater than 0.05 hectares in area.

One site, Uruti Bay Wetland, was assessed using both existing information and a rapid site inspection. The most useful information sources for the assessments were found to be the natural character worksheet, aerial photographs and local fauna practitioners. Site inspections can be used for 'ground-truthing', to address information gaps and check accuracy.

40. In my opinion, six of the sites meet the Appendix 5 criteria for ecological significance, nine sites probably meet the criteria, and the remaining two sites are also likely to meet the criteria. Only four of these sites are identified as SBA and none are identified as SEA.

41. From these investigations it appears that the Appendix 5 criteria for ecological significance provided in the Regional Policy Statement have not been applied comprehensively despite it being a requirement of method 4.4.3(1) of the RPS that the criteria be applied to "water bodies (including wetlands) ……. in the CMA". As a consequence, a number of sites that meet the Appendix 5 criteria have not been identified as SEA in the Proposed Regional Plan.

Outcomes

30. Mr Vincent Kerr has agreed that "Uruti Bay Wetland" be included as a "Significant Ecological Area" and Northland Regional Council has accepted his recommendation. He also states that he does "not recommend re-classification of the remaining sixteen areas"[13]. In my opinion, Mr Kerr has not provided adequate reasons for not assessing these sites and all other sites of High Natural Character using the criteria in Appendix 5 and considering them for inclusion as SEA if they meet one or more of the criteria.

31. Two reasons Mr Kerr provides for not considering further investigation of the sites I assessed is that "the marine values associated with these catchments were degraded with sedimentation" and "the marine component which formed the connectivity to the salt marsh (edge community) and freshwater systems, were mangrove forests"[14].

13 Paragraph 9.12 of the evidence of Mr Vincent Kerr.
14 Paragraph 9.7 of the evidence of Mr Vincent Kerr

32. I don't agree with this reasoning. The catchment of Uruti Bay Wetland is degraded to some extent (it includes a rubbish dump and a road passes through the wetland) but, despite this, the wetland has ecological values that meet the criteria and warrant its inclusion as an SEA. Neither do I accept that it is valid to exclude a site as an SEA because it is mangroves that provide connectivity to saltmarsh. Mangroves are a naturally occurring component of intertidal habitats in Northland, particularly in association with saltmarsh.

33. It should also be noted that a site needs to meet only one Appendix 5 criterion to meet the threshold for significance. Thus, even if a site doesn't meet the criteria relating to buffering and connectivity it will still meet the threshold for ecological significance if it meets even only one other criterion.

34. In his evidence Mr Kerr has misrepresented my methods and findings[15]. He states that I have pointed "to values that score highly in Criterion 3 - Diversity and pattern' and Criterion 4 – 'Ecological context'. This is not correct because I did not undertake any scoring process. Using available information, I assessed sites using the criteria in Appendix 5, which does not include a scoring system and does not require sites to "score highly" to meet the criteria for ecological significance.

35. Mr Kerr also states that my work "primarily focuses on the terrestrial components of the system and values. For example ……. the presence of the sequence of good riparian cover and bush regeneration, saltmarsh and mangrove"[16]. I disagree with this, and note that saltmarsh and mangrove are not terrestrial vegetation types. Besides, Mr Kerr, when assessing sites, considers terrestrial matters such as "catchment values, riparian cover……..and the presence of active restoration activity and support by the community"[17]. (The latter two factors are not included in Appendix 5 and, in my opinion, are not appropriate criteria for assessing ecological significance).

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[15] Paragraph 9.4 of the evidence of Mr Vincent Kerr
[16] Paragraph 9.4 of the evidence of Mr Vincent Kerr
[17] Paragraph 9.6 of the evidence of Mr Vincent Kerr

36. When assessing the connectivity and buffering functions of a site, in my opinion it is not appropriate to consider these as occurring in only 'one direction'. An intertidal site can provide buffering to palustrine or terrestrial habitats above the level of high tide, to other intertidal sites and/or to marine sites.

37. Mr Kerr goes on to say I argued that "the marine ecological values should be scored high ranking"[18]. I did not make any arguments about "marine ecological values" and I did not score or rank any sites. My work assessed primarily intertidal sites[19] against Appendix 5 using the information available for each site. Appendix 5 does not include a ranking system.

38. Mr Kerr partially attributes our differences of opinion to dealing with matters of scale[20]. I acknowledge that scale can be a challenge when defining what a "site" is and delineating site boundaries. However, the scale of the assessment area is relevant only when assessing a site in relation to other sites. None of the criteria in Appendix 5 explicitly require this. It could be interpreted that Criterion 1b(i) (which refers to sites that are "large" or a "good example") may require assessment relative to other sites, but this is not explicit.

39. The scale of the assessment area would be relevant if the goal was to identify only the "best" sites (e.g. only "regionally significant" or "nationally significant" sites) within a defined geographical area or if working under the premise that the number of sites to be identified must be limited. Appendix 5 and Method 4.4.3(1) do not limit the potential number of sites that can be identified as ecologically significant. It states only that a site needs to meet one of more of the criteria to be considered significant.

40. Uruti Bay Wetland is just one example of a site that was not previously identified as an SEA but which, when assessed against the criteria using all available information and ground-truthing, was found to meet the criteria in Appendix 5. This probably occurred because some sites, including Uruti Bay Wetland, have not been assessed.

[18] Paragraph 9.4 of the evidence of Mr Vincent Kerr
[19] Neither the RPS or the Regional Plan include a definition for "marine" or "marine site". I assume Mr Kerr uses these terms to refer to habitats below Mean Low Water Spring.
[20] Paragraph 9.10 of the evidence of Mr Vincent Kerr

Only those sites that were initially deemed to be "potentially high ranking" progressed to being assessed against the criteria[21], which means many more sites may have been overlooked. In my opinion it is also a problem that avifauna were excluded from the SEA assessments. Mr Kerr has previously acknowledged that "the decision was not based on an ecological argument – it was essentially a preferred approach from a planning and policy perspective."[22]

Using High Natural Character as a proxy for ecological significance

41. As discussed, I believe there are sites that meet the Appendix 5 ecological significance criteria in the Regional Policy Statement but have not been identified as SEA in the Proposed Regional Plan. A potential way to begin to address this could include use of the natural character worksheet.

42. The natural character worksheet provides information that enables sites to be assessed in relation to aspects of Criterion 1 (Representativeness) and Criterion 3 (Diversity and pattern). The worksheet was not found to be useful for assessing Criterion 2 (Rarity / distinctiveness) because it is beyond the scope of the natural character methodology to provide detail about the extent of each vegetation type or the presence of 'threatened' and 'at risk' species. Criterion 4 (Ecological context) is also beyond the scope of the natural character methodology because it is concerned with connectivity, ecosystem services and fauna.

43. Dr Victoria Froude, who developed the methodology and undertook the work to identify and map natural character areas in Northland, states in Paragraph 3.8 of her evidence that sites with high natural character "Consist entirely or almost entirely of nature, especially indigenous nature" and "Relative to other Northland coastal sites, there is a moderate to a high level of matching to reference conditions for….biological structures and composition and ecological processes".

44. Appendix 5 states that a site is ecologically significant if it "…..comprises largely indigenous vegetation types; and is typical of what would have existed circa 1840".

[21] Paragraph 4.4 of the evidence of Mr Vincent Kerr
[22] Paragraph 17 of Mr Vincent Kerr's rebuttal evidence dated 31 July 2020.

In my opinion, this criterion is consistent with the description Dr Froude provides for sites of “High Natural Character”.

45. I anticipate that many sites of “High Natural Character” also meet the Appendix 5 criteria for ecological significance and, thus, should appropriately be subject to further investigation and assessed for inclusion as SEA.

46. A visual assessment comparing the extents of sites identified as Outstanding Natural Character and High Natural Character with those of SEA and SBA suggests that the localities with the most obvious gaps are Taipa Estuary, Mangonui Harbour, Whangaroa Harbour, Te Puna Inlet, Kerikeri Inlet, the inner Bay of Islands south of Russell and Waitangi, and the Herekino, Whangape and Hokianga Harbours. Many of these sites appear to comprise mangroves, saltmarsh and/ or freshwater wetlands. The criteria in Appendix 5 are applicable to these vegetation and habitat types and, therefore, should be used to assess the ecological significance of these areas.

Issues with relying on natural character sites to identify potential SEAs

47. As previously stated, my assessment is that there are gaps in the mapping of SEA and SBA. Maps of “High Natural Character” sites could be used to identify areas that warrant further investigations and assessment. However, relying on the natural character data alone will not address all the gaps in the SEA mapping.

48. It is beyond the scope of the natural character methodology to identify sites that have fauna values or are habitat for ‘threatened’ or ‘at risk’ flora. Thus, relying only upon natural character maps to identify sites that are potentially ecologically significant may result in such habitats being overlooked.

49. An example of this is Uruti Bay beyond the extent of “Uruti Bay Wetland”. The intertidal flats at this location provide habitat for fish and wading and diving birds (including ‘threatened’ and ‘at risk’ species), support swards of seagrass and sustain important shellfish beds. The Uruti Bay intertidal flats have not been identified as SEA or SBA despite meeting the criteria in Appendix 5.

Extent of SEAs at Marsden and Mangawhai

50. I have been asked to provide comment on the reinstatement of SEA in Whangarei Harbour. Mr Andrew Lohrer and Mr Vincent Kerr describe the ecological values of the sites and, based on this information, I agree with Mr Lohrer's conclusion that "several of the Appendix 5 criteria for designating Mair Bank, Marsden Bank, and the area west of Northport as Significant Ecological Areas have been met".....and ....." that Mair Bank and Marsden Bank should remain as Significant Ecological Areas and the area west of Northport should be reinstated as a Significant Ecological Area"[23].

51. I have also been asked to provide comment on Mangawhai Harbour Restoration Society's (MHRS) appeal to reduce the area of the SEA that encompasses three intertidal flats at Mangawhai Estuary[24]. The appeal states that the designation would have "significant practical implications for the MHRS' harbour maintenance and restoration" such as "dredging or beach/foreshore sand deposition/restoration". On this matter I defer to the evidence provided by Mr Kerr[25] and the information in the Regional Policy Statement. On this basis, I consider the site meets criteria 1, 2 and 4 in Appendix 5 and support Mr Kerr's recommendation that the extent of the site not be reduced.

Conclusions

52. I used the criteria in Appendix 5 of the Regional Policy Statement for Northland to assess the ecological significance of seventeen (17) mapped sites of High Natural Character. Only four of the sites are identified in the Proposed Regional Plan as SBA and none are identified as SEA. In my opinion, six of the sites meet the Appendix 5 criteria, nine sites probably meet the criteria and the remaining two sites are likely to meet the criteria, subject to further assessment and/or ground-truthing.

[23] Paragraph 5.1 of the evidence of Mr Andrew Lohrer
[24] MHRS notice of appeal dated 17 June 2017.
[25] Section 7 of the evidence of Mr Vincent Kerr

53. In my opinion, the criteria in Appendix 5 have not been applied comprehensively despite it being a requirement of method 4.4.3(1) of the RPS and, as a consequence there are likely to be many other sites in Northland Region that meet the Appendix 5 criteria but have not been identified as SEA in the Proposed Regional Plan.

54. I used the Natural Character Worksheet to assist with the site assessments and found that it could be used to identify sites that meet aspects of Criterion 1 (Representativeness) and Criterion 3 (Diversity and pattern). Almost by definition, sites of High Natural Character meet Criterion 1 in Appendix 5 and a site needs to meet only one criterion to be regarded as ecologically significant. I anticipate that many sites of High Natural Character also meet the Appendix 5 criteria for ecological significance and, therefore, should be subject to further investigation and assessed for inclusion as SEA.

55. A visual assessment comparing the extents of sites identified as Outstanding Natural Character and High Natural Character with those of SEA and SBA suggests that the localities with the most obvious "gaps" are Taipa Estuary, Mangonui Harbour, Whangaroa Harbour, Te Puna Inlet, Kerikeri Inlet, the inner Bay of Islands south of Russell and Waitangi, and the Herekino, Whangape and Hokianga Harbours. The criteria in Appendix 5 can be applied to these sites using existing information.

56. These "gaps" in the mapping of SEAs probably occurred because some sites, such as Uruti Bay Wetland, were not assessed using Appendix 5. Only those sites that were initially deemed to be "potentially high ranking" progressed to being assessed for inclusion[26], which means many more sites may have been overlooked. In my opinion it is also a problem that avifauna were excluded from the SEA assessments for reasons of "planning and policy".[27]

57. Mr Kerr recommended that one of the sites I assessed ("Uruti Bay Wetland") be included as SEA and Northland Regional Council has accepted his recommendation. However, Uruti Bay Wetland is just one example of a site that was not previously

[26] Paragraph 4.4 of the evidence of Mr Vincent Kerr
[27] Paragraph 17 of Mr Vincent Kerr's rebuttal evidence dated 31 July 2020.

identified as an SEA but which, when assessed against Appendix 5 using all available information and ground-truthing, was found to meet the criteria for ecological significance.

58. Mr Kerr states that he does "not recommend re-classification of the remaining sixteen areas"[28]. In my opinion, Mr Kerr has not provided adequate reasons for not assessing these sites, and all other sites of High Natural Character, using the criteria in Appendix 5, and considering them for inclusion as SEA if they meet one or more of the criteria.

59. I was asked to comment on the extent of SEAs at Whangarei Harbour and Mangawhai. In these matters I refer to the evidence of Mr Andrew Lohrer and Mr Vincent Kerr and support their recommendations that areas of SEA at Whangarei be reinstated and that the SEA at Mangawhai not be reduced.

Lisette Collins
16 October 2020

[28] Paragraph 9.12 of the evidence of Mr Vincent Kerr.

Attachment 1

Criteria for assessing ecological significance
(Appendix 5 of the Regional Policy Statement for Northland)

An area of indigenous vegetation or habitat(s) of indigenous fauna is significant if it meets one or more of the following criteria:

1. Representativeness

(a) Regardless of its size, the ecological site is largely indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity at the relevant and recognised ecological classification and scale to which the ecological site belongs:

i. If the ecological site comprises largely indigenous vegetation types; and
ii. Is typical of what would have existed circa 1840; or
iii. Is represented by faunal assemblages in most of the guilds expected for the habitat type; or

(b) The ecological site

i. Is a large example of indigenous vegetation or habitat of indigenous fauna, or
ii. Contains a combination of landform and indigenous vegetation and habitat of indigenous fauna, that is considered to be a good example of its type at the relevant and recognised ecological classification and scale.

2. Rarity / distinctiveness

(a) The ecological site comprises indigenous ecosystems or indigenous vegetation types that:

i. Are either Acutely or Chronically Threatened land environments associated with LENZ Level 4); or
ii. Excluding wetlands, are now less than 20% of their original extent; or
iii. Excluding man-made wetlands, are examples of the wetland classes that either otherwise trigger Appendix 5 criteria or exceed any of the following area
a) Saltmarsh greater than 0.5 hectare in area; or
b) Shallow water (lake margins and rivers) greater than 0.5 hectare in area; or
c) Swamp greater than 0.4 hectare in area; or
d) Bog greater than 0.2 hectare in area; or
e) Wet Heathlands greater than 0.2 hectare in area; or
f) Marsh; Fen; Ephemeral wetlands or Seepage / flush greater than 0.05 hectares in area.

(b) Indigenous vegetation or habitat of indigenous fauna that supports one or more indigenous taxa that are threatened, at risk, data deficient or uncommon, either nationally or at the relevant ecological scale.

(c) The ecological site contains indigenous vegetation or an indigenous taxon that is:

i. Endemic to the Northland-Auckland region; or
ii. At its distributional limit within the Northland region;

(d) The ecological site contains indigenous vegetation or an association of indigenous taxa that:

i. Is distinctive of a restricted occurrence; or
ii. Is part of an ecological unit that occurs on an originally rare ecosystem; or

iii. Is an indigenous ecosystem and vegetation type that is naturally rare or has developed as a result of an unusual environmental factor(s) that occur or are likely to occur in Northland; or
iv. Is an example of nationally or regionally rare habitat as recognised in the New Zealand Marine Protected Areas Policy.

3. Diversity and pattern

(a) Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of:
i. Indigenous ecosystem or habitat types; or
ii. Indigenous taxa;

(b) Changes in taxon composition reflecting the existence of diverse natural features or ecological gradients; or
(c) Intact ecological sequences.

4. Ecological context

(a) Indigenous vegetation or habitat of indigenous fauna is present that provides or contributes to an important ecological linkage or network, or provides an important buffering function; or
(b) The ecological site plays an important hydrological, biological or ecological role in the natural functioning of riverine, lacustrine, palustrine, estuarine, plutonic (including karst), geothermal or marine system; or
(c) The ecological site is an important habitat for critical life history stages of indigenous fauna including breeding / spawning, roosting, nesting, resting, feeding, moulting, refugia or migration staging point (as used seasonally, temporarily or permanently).

Attachment 2

Ecological Assessment of Uruti Bay Wetland

Attachment 3

Assessment of thirteen sites of "High Natural Character" against the criteria for ecological significance

Attachment 4

Ecological assessments of six sites of "high natural character"

EB.352

Prepared for:
CEP Services Matauwhi Ltd
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August 2019

Ecological Assessment of Uruti Bay Wetland

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Contents

1. Introduction

Uruti Bay Wetland is located in the "Coastal Environment" on the Russell Peninsula, approximately 1.5 km southeast of Russell Village (**Figure 1**). The site includes a tidal channel and estuarine and palustrine (i.e. freshwater) vegetation types that extend over an area of approximately 7.7 hectares.

The purpose of this report is to assess the ecological significance of the entire site and of a portion of the site (that which lies within the "Coastal Marine Area") using the significance criteria in Appendix 5 of the Regional Policy Statement for Northland. To achieve this, existing ecological information about the site was compiled and a site inspection was undertaken to map and describe the vegetation and habitats within the site.

Figure 1: Uruti Bay Wetland (shown in red) is located approximately 1.5km southeast of Russell Village.

2. Methods

For the purpose of this report, the extent of "Uruti Bay Wetland" is defined by the boundaries mapped for the site within the Coastal Environment in the Regional Policy Statement (**Figure 2**). The portion of the site south of Russell-Whakapara Road is also within the "Coastal Marine Area".

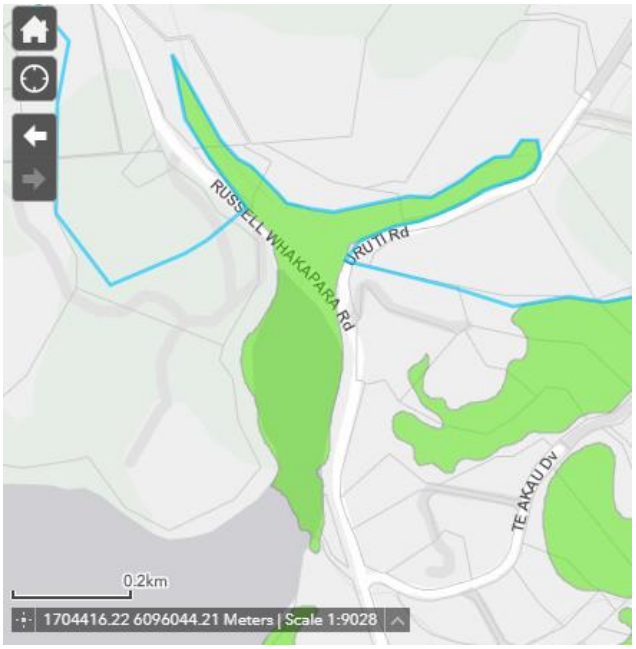

Figure 2: A screenshot of Uruti Bay Wetland as it is mapped in the Regional Policy Statement (localmaps.nrc.govt.nz). The blue line is the inland boundary of the "Coastal Environment". Note: the Coastal Marine Area extends only to Russell-Whakapara Road.

Existing ecological information about Uruti Bay Wetland was compiled and reviewed, including published and unpublished information. A fish survey, reptile survey and nocturnal kiwi survey were beyond the scope of this report so existing information about fauna was obtained from experienced, competent observers. The observers are associated with local conservation projects, such as Russell Landcare Trust, Russell Kiwi Protection Project and/or participate in the annual kiwi call-count monitoring project overseen by the Department of Conservation.

A site inspection was undertaken to map and describe the vegetation and habitat types at the site. An exhaustive flora survey was not undertaken because existing information and the vegetation descriptions compiled during the visit provided sufficient data to enable the site to be assessed against the criteria in the Regional Policy Statement for Northland (refer to **Appendix 4**). The site inspection was carried out 23 August during sunny spells and showers with moderately-strong winds.

3. Existing Ecological Information

3.1 Whangaruru Ecological District

New Zealand is divided into Ecological Districts, with each District possessing topographical, geological, climatic, soil and biological features that result in a characteristic landscape and range of vegetation and habitat types. Uruti Bay Wetland is located in the Whangaruru Ecological District ('the District') which extends along the east coast from Russell, in the north, to Parua Bay in the south and includes 46 islands and island groups. In 2005, a Protected Natural Areas Programme report was published to provide information for the Department of Conservation, local bodies, resource management planners, iwi, landowners, interest groups and the public at large (Booth 2005).

Much of the Whangaruru Ecological District has been modified, particularly towards its southern end but it retains a high diversity of vegetation types at inland, coastal and island sites and there are some large expanses of native forest in the north (e.g. Russell Forest and the Cape Brett Peninsula). The fragmented nature of surviving habitats has made them vulnerable to weed invasion. Introduced mammals are also a major threat.

Booth (2005) described a variety of vegetation types within the estuarine wetlands of Whangaruru Ecological District including:

- mangrove (*Avicennia marina* subsp. *australasica*)[1] shrubland and forest, often with raupo (*Typha orientalis*), *Machaerina articulata*, oioi (*Apodasmia similis*), and/or sea rush (*Juncus kraussii* subsp*. australiensis*) on the margins.
- Oioi saltmarsh with one or more of kanuka (*Kunzea robusta*), manuka (*Leptospermum scoparium*), mangrove, *Juncus* sp., saltmarsh ribbonwood (*Plagianthus divaricatus*), raupo, and/or sea rush.
- *Bolboschoenus* sp. – *Coprosma* sp. – harakeke (flax, *Phormium tenax*) – saltmarsh ribbonwood saltmarsh
- *Cotula* sp. – *Isolepis* sp. – sea primrose (*Samolus repens*) – selliera (*Selliera radicans*) association
- *Cyperus* sp. with low amounts of raupo, sea rush, kuta (*Schoenoplectus tabernaemontani*), oioi, and harakeke
- Glasswort (*Salicornia quinqueflora*) saltmarsh
- *Juncus* sp. – saltmarsh ribbonwood saltmarsh, with infrequent mangrove and manuka
- Sea primrose saltmarsh, with glasswort, selliera, saltmarsh ribbonwood, and knobby clubrush (wiwi, *Ficinia nodosa*).

[1] Scientific names are provided the first time a species is mentioned. Thereafter, the common name ise used if one exists.

Raupo reedland is the most common type of freshwater wetland in Whangaruru Ecological District (Booth 2005). It may be the sole dominant species or co-dominate with harakeke, rushes (*Juncus* spp.), kanuka or manuka. Other species such as kuta, ti kouka (cabbage tree, *Cordyline australis*), giant umbrella sedge (*Cyperus ustulatus*) or, less commonly, *Machaerina articulata*, *M. teretifolia*, wheki (*Dicksonia squarrosa*), shaking brake (*Pteris tremula*), swamp millet (*Isachne globosa*) and *Hebe* sp. Wetlands dominated by rushes and/or sedges are less common than raupo-dominated wetlands.

3.2 Regional Policy Statement

Uruti Bay Wetland is included in the Regional Policy Statement for Northland ('the statement') as a site that has High Natural Character. Features that were assessed to determine the natural character values of sites in the coastal environment of Northland Region included 'ecological naturalness' (e.g. vegetation cover, impact of introduced mammals), 'hydrological and geomorphological naturalness' (e.g. changes to hydrology, water quality or landform) and 'freedom from buildings and structures' (Froude 2014).

In the statement, Uruti Bay Wetland is described as:

> "Mangroves with a road causeway (Russell Road). Upstream of mangroves there is a limited area of oioi saltmarsh and a two armed freshwater wetland dominated by raupo with some native shrubs. Boardwalk across 1 arm of freshwater wetland."

Values that contributed to the natural character of the site were:

> "Largely indigenous vegetation with few pest plants. Continuum mangroves, saltmarsh to freshwater wetland. Part of a continuum of marine to terrestrial ecosystems. Part of community pest control area."

3.3 Manaaki Whenua Whenua/Landcare Research Databases

Manaaki Whenua/Landcare Research is the lead Crown Research Institute for New Zealand's terrestrial biodiversity and land resources. Through their website, the institute has made available land cover datasets and mapping technologies, including The Land Cover Database (LCDB) and Threatened Environment Classification (TEC).

Landcover Database

The LCDB mapping for Uruti Bay Wetland is shown in **Figure 3**. However, the mapping scale has not enabled for the correct identification of vegetation in the wetland. For example, the mangroves south of Russell Whakapara Road are mapped as 'Herbaceous (Wetlands)', when in fact mangroves are woody, not herbaceous. The western arm of the wetland is correctly mapped as herbaceous wetland but the eastern arm is not.

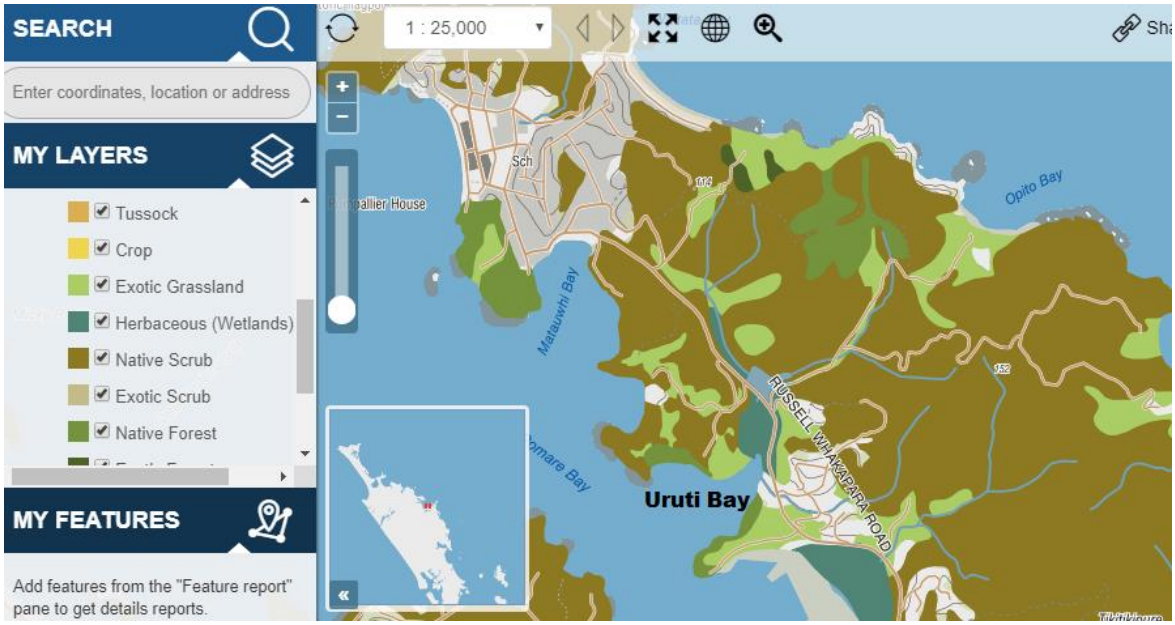

Figure 3: A screenshot of the Landcover Database with Uruti Bay Wetland at the centre of the frame.

Threatened Environment Classification

Threatened Environment Classification is derived from the LCDB, Land Environments New Zealand (LENZ) and protected areas mapping. Parts of Uruti Bay Wetland are classified as a Category 3 land environment where 20-30% of indigenous cover remains and where indigenous biodiversity has been much reduced and habitats are seriously fragmented (**Figure 4**). However, some of the vegetation is mapped incorrectly in the LCDB (refer to the paragraph above) and a large portion of the site is not classified. Presumably this is because

it lies below the level of mean highwater springs and LENZ classifies New Zealand's "terrestrial" environments" (Cieraad *et al.* 2015).

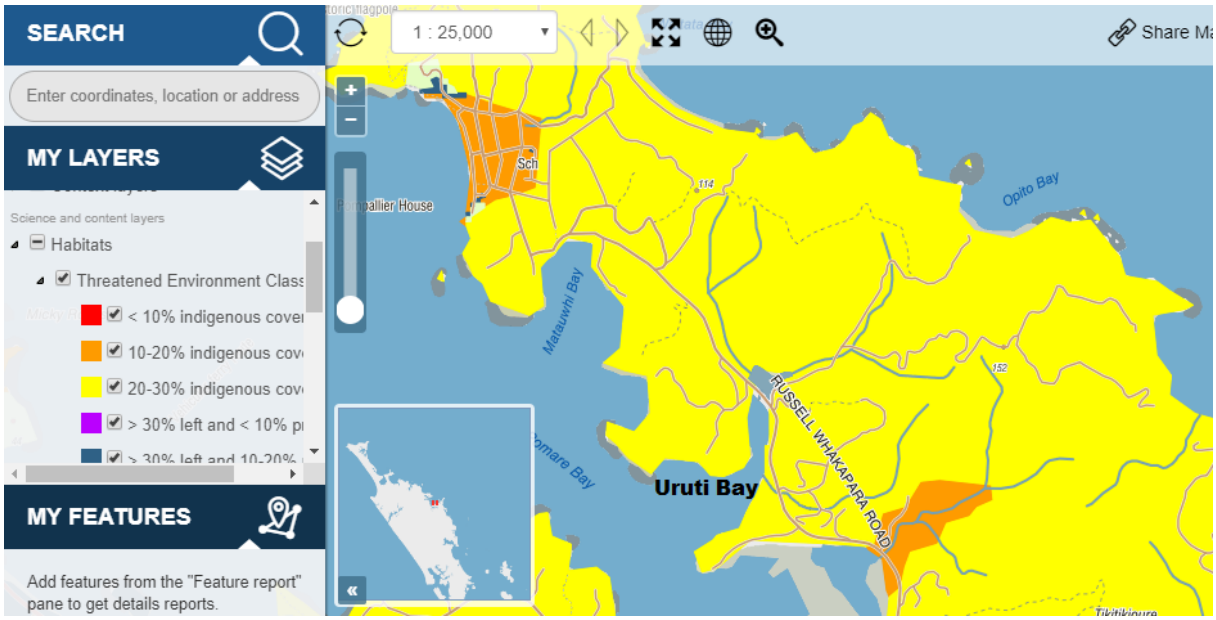

Figure 4: A screenshot of Threatened Environment Classifications with Uruti Bay Wetland at the centre of the frame.

3.4 Avifauna

North Island Brown Kiwi (*Apteryx mantelli*)

The North Island Brown Kiwi is classified as an 'At Risk -Declining'[2] species. They can be found in shrubland and forest remnants throughout Whangaruru Ecological District, with the highest densities occurring at managed sites on Russell Peninsula (Booth 2005). Kiwi on the Russell Peninsula are being protected by private landowners and Russell Kiwi Protection, a project established in 2016 by the Russell Landcare Trust. The project controls stoats on over 2,000 hectares, undertakes intensive rat control in very high value habitat, works with landowners and advocates for kiwi (www.russellkiwi.org.nz).

The co-ordinator of Russell's annual kiwi call-count monitoring was caretaker of a property bounding Uruti Bay Wetland that has been managed to protect kiwi for more than 20 years. In 2002 he placed two kiwi nest boxes on the margin of the wetland. Within two months, both boxes showed signs of occupancy and they are still being used by kiwi (K. Russell, Pers. Comm.). Infrared cameras placed on the margins of Uruti Bay Wetland in July 2019 detected

[2] Threat Classifications for birds follow Robertson *et al.* 2017.

both kiwi and weka (E. Harwood, Co-ordinator of Russell Kiwi Protection Project, Pers. Comm.).

In 2016, the Department of Conservation produced a map of Northland that shows kiwi as either 'present' or 'high density' or, by omission, 'presumed absent' (**Figure 5**). The entire Russell Peninsula, including Uruti Bay Wetland is identified as an area with a high density of kiwi.

Figure 5: Part of a map of Northland that shows kiwi populations as either 'present' (pale yellow) or 'high density' (purple) (Department of Conservation 2016). The approximate location of Uruti Bay Wetland is marked with a white 'x'.

Australasian bittern/Matuku (*Botaurus poiciloptilus*)

The Australasian bittern is classified as 'Threatened-Nationally Critical', which is the highest (i.e. most serious) threat classification. They have been heard calling in Uruti Bay Wetland during the previous year (Pers. Obs. and E. Harwood, Pers Comm.). In 2011, a bittern was photographed on the edge of the wetland next to Uruti Road (**Plate 1, Appendix 1**).

Banded rail (*Gallirallus philippensis*)

Banded rail (classified as 'At Risk -Declining') can be found in mangroves and saltmarshes and, less frequently, in freshwater wetlands. They are shy and elusive but have been heard and/or seen within the past year in the mangroves on both sides of Russell-Whakapara Road and in the raupo wetland (e.g. E. Harwood and C. Worthington, Pers. Comm.). In February 2011 a banded rail was photographed on the edge of raupo wetland next to Uruti Road (**Plate 2, Appendix 1**).

Fernbird/Matata (*Bowdleria punctata*)

Fernbird ('At Risk -Declining') are small and well-camouflaged but are vocal and have a distinctive call that can be elicited by making clicking noises. All of the observers contacted for this study reported hearing and/or seeing fernbird in Uruti Bay Wetland (e.g. Froude V. and Russell K., Pers. Comm).

Weka (*Gallirallus australis greyi*)

The Russell Peninsula, specifically the area around Russell Village, is a stronghold of the North Island Weka, which is classified as an 'At Risk-Recovering' species. Weka are common in Uruti Bay and were detected on infrared trail cameras situated on the margins of the wetland (E. Harwood, Pers. Comm.).

Spotless Crake/Pūweto (*Porzana tabuensis*)

Spotless crake (At Risk -Declining') are seldom seen because they are uncommon, secretive and most active at twilight. However, their calls have been heard in the raupo wetland and mangrove forest at Uruti Bay Wetland (Pers. Obs. and C. Worthington, Pers. Comm.).

Caspian tern (*Hydroprogne caspia*)

Caspian Tern ('Threatened-Nationally Vulnerable') roost in the mangroves south of Russell-Whakapara Road (Pers. Obs. 2019).

Shags (*Phalocrocorax* spp.)

When asked, observers stated they had seen shags at the site, particularly within the mangroves. They may have seen the black shag (*Phalacrocorax carbo,* At Risk-Naturally Uncommon), little shag (*Phalacrocorax melanoleucos*) and/or pied shag (*Phalacrocorax varius,* At Risk-Recovering).

Kotuku (white heron, *Ardea modesta*)

In recent years a kotuku (Threatened-Nationally Critical) has been observed feeding in Uruti Bay during low tide and roosting in mangroves and kanuka trees in Orongo Bay (Pers. Obs., K. Russell and E. Harwood Pers. Comm.). Kotuku have not been recorded within the site but may utilise it.

3.5 Fish

A local ichthyologist who has undertaken informal surveys for freshwater fish in Uruti Bay Wetland has recorded redfin bully (*Gobiomorphus huttoni*), common bully (*Gobiomorphus cotidianus*), Cran's bully (*Gobiomorphus basalis*), shortfin eel (*Anguilla australis*) and a large population of banded kokopu (*Galaxias fasciatus*) (C. Worthington, Pers. Comm.). He also reports a large population of giant bully (*Gobiomorphus gobioides*, 'At Risk'[3]) in Orongo Bay, which is the next bay to the south of Uruti Bay and provides similar habitat (ibid.). Therefore, he believes giant bully may be present in Uruti Bay Wetland.

Fish species observed in the estuarine portion of the site include yellow-eyed mullet (*Aldrichetta forsteri*), snapper (*Pagrus auratus*), kahawai (*Arripis trutta*), goatfish (*Upeneichtys* sp.), spotties (*Notolabrus celidotus*), parore (*Girella tricuspidata*) and flounder (*Rhombosolea* spp.) (C. Worthington, Pers. Comm.).

3.6 Reptiles

Auckland green gecko (Elegant gecko, *Naultinus elegans*) have been sighted in manuka and kanuka within two metres of the raupo wetland (K. Russell, Pers. Comm.). This species is classified 'At Risk-Declining' (Hitchmough *et al.* 2016).

[3] Threat classifications for freshwater fish follow Dunn *et al.* 2017.

4. Site Description

4.1 Vegetation and Habitats

Uruti Bay Wetland comprises three main vegetation and habitat types: Mangrove scrub and forest, oioi-dominated saltmarsh and raupo-dominated freshwater wetland (**Figure 6)**. These vegetation types grade into each other and there are patches of saltmarsh within both the mangrove scrub and the raupo-dominated wetland (**Plate 3, Appendix 1**).

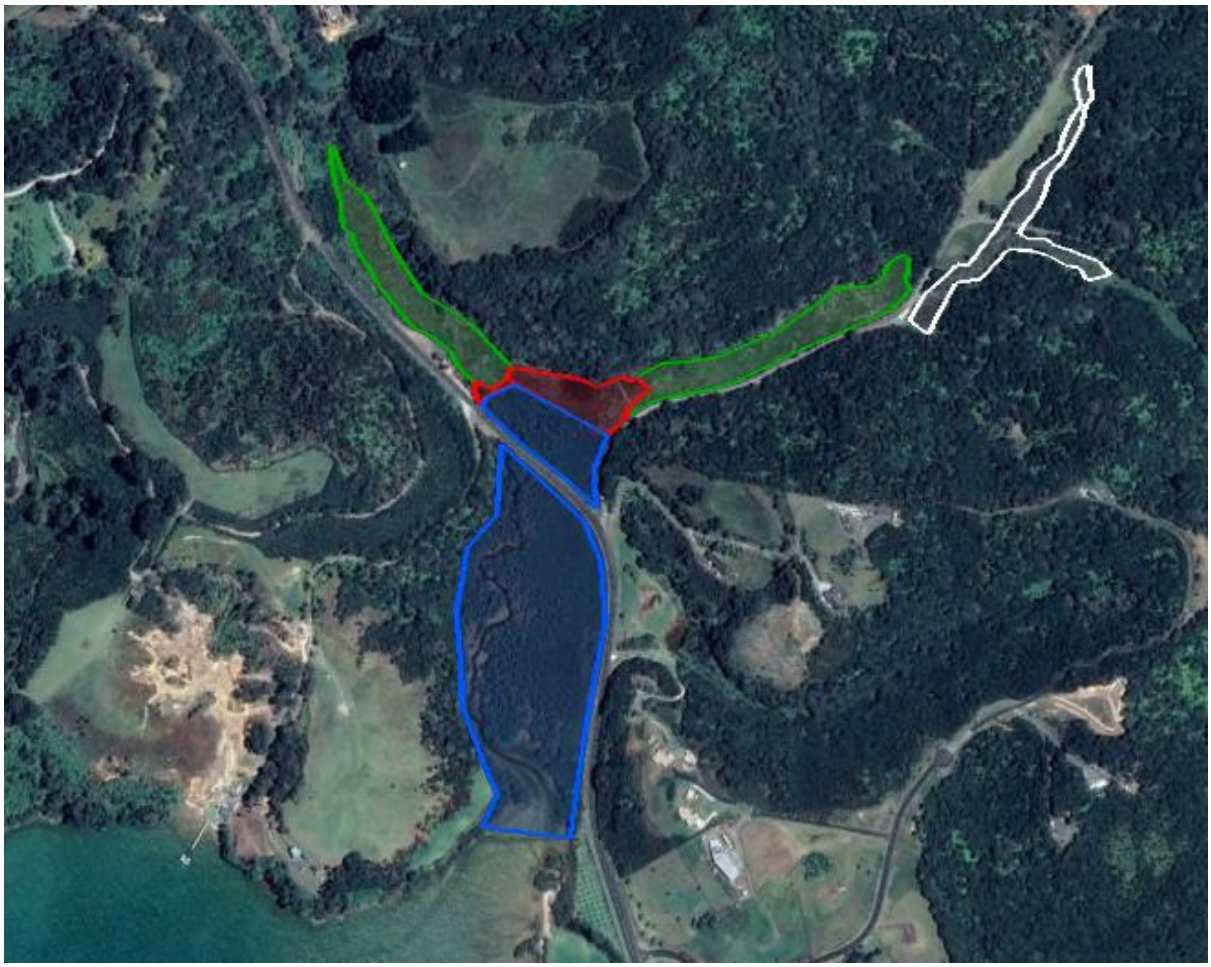

Figure 6: Vegetation types within Uruti Bay Wetland: mangrove scrub and forest (blue), oioi-dominated saltmarsh (red) and raupo-dominated freshwater wetland (green). A contiguous and hydrologically connected area of raupo wetland is shown in white.

Mangroves occupy *c.*5.3 hectares on both sides of Russell-Whakapara Road (**Plates 4 & 5, Appendix 1**). South of Russell-Whakapara Road there are unmapped areas of saltmarsh vegetation growing in a narrow band (up to *c.* 10m wide) on the inland margins of the mangroves. North of the road, saltmarsh occurs on the margins of the mangroves and also as unmapped patches within and beneath the mangrove canopy. Oioi-dominated saltmarsh occurs higher in the tidal range than mangroves and occupies *c.* 0.5 ha of the site (**Plate 6, Appendix 1**). Other species in both the mapped and unmapped areas of saltmarsh (i.e. within the mangroves) include *Machaerina juncea,* kuta, searush, giant umbrella sedge and occasional saltmarsh ribbonwood. There are also scattered pampas (*Cortaderia selloana*).

The two "arms" of Uruti Bay Wetland extend for *c.* 1.9 ha and are dominated by raupo with scattered manuka and occasional ti kouka emergent above the raupo. Other species within or on the margins of this vegetation type include oioi, *Baumea juncea,* harakeke, *Machaerina rubiginosa*, *M. teretifolia*, swamp millet, kiokio, wheki (*Dicksonia squarrosa*) and *Carex lessoniana.* Watercress (*Nasturtium* sp.) is present in the channel.

The raupo wetland in the eastern arm of Uruti Bay Wetland extends beyond the boundary of the mapped site, covering a further *c.*0.75 ha. It is hydrologically connected with Uruti Bay Wetland and the vegetation is consistent with that which occurs within the site.

It is beyond the scope of this report to map or describe the terrestrial vegetation (scrub and forest) that surrounds the wetland. However, some of the species within the scrub and forest are also growing on the boundary of the wetland, including kanuka (*Kunzea robusta*), mahoe (*Melicytus framiflorus*), hangehange (*Geniostoma ligustrifolium*), ti kouka, turutu (*Dianella nigra*), mapou (*Myrsine australis*) and karamu (*Coprosma robusta*).

Invasive plants (i.e. weeds) are largely confined to the margins of the wetland. Species present include wild ginger (*Hedychium gardnerianum*), gorse (*Ulex europaeus*), tobacco weed (woolly nightshade, *Solanum mauritianum*), kikuyu grass (*Cenchrus clandestinus*), blackberry (*Rubus fruticosus*) and black wattle (*Acacia mearnsii*). Pampas (*Cortaderia selloana*) is present on the margin and also occurs as scattered individuals within the saltmarsh and raupo wetland.

4.2 Flora

Twenty-six (26) indigenous species of vascular plants were recorded during vegetation mapping (refer to **Appendix 2**). None of these species are included in the New Zealand Threat Classification List (de Lange *et al.* 2017) and all are typical of the landform and hydrology. Thirteen (13) invasive weeds were also recorded (refer to **Appendix 3**). Most have the potential to invade drier sites in the raupo wetland and some (e.g. pampas) have already established in the saltmarsh.

4.3 Fauna

Nine species of native birds were seen or heard within the wetland during the site inspection: weka, fernbird, Australasian harrier (*Circus approximans*), piwakawaka (fantail; *Rhipidura fulginosa*), silvereye (tauhou, *Zosterops lateralis*), riroriro (grey warbler; *Gerygone igata*), pukeko (*Porphyrio* porphyrio), tui (*Prosthemadera novaeseelandiae*) and white-faced heron (*Egretta novaehollandiae*).

In addition to the bird species recorded in Section 4 and/or observed during the site inspection, ruru (morepork, *Ninox novaeseelandiae*) will almost certainly be roosting in the mangroves or manuka during the day.

5. Ecological Significance

Appendix Five of the Regional Policy Statement for Northland sets out criteria for determining the ecological significance of vegetation and habitats (**Appendix 4**). An area of indigenous vegetation or habitat is significant if it meets one or more of the criteria.

Uruti Bay Wetland, comprising the entire area mapped within the "Coastal Environment", was assessed against the criteria and found to meet at least one component of each of the four criteria (refer to **Table 1**). The portion of the site that lies within the "Coastal Marine Area" (i.e. mangrove vegetation south of Russell-Whakapara Road) was assessed separately and found to meet three of the criteria.

Table 1: A summary of the criteria for ecological significance in Appendix 5 of the Regional Policy Statement for Northland and an assessment of Uruti Bay Wetland against each criterion.

	Uruti Bay Wetland	
Criteria	**Notes**	**Criterion met?**
1. Representativeness		**Yes**
1(a) i. The site comprises largely indigenous vegetation types; and	Indigenous wetland vegetation with a low level of weed invasion.	Yes
ii. Is typical of what would have existed circa 1840; or	The vegetation is representative of that which would have occurred prior to 1840. However, the relative proportions of each vegetation type has been altered by the road causeway and changes in surrounding landuses.	Yes
iii. Is represented by faunal assemblages in most of the guilds expected for the habitat type; or	The site is habitat for common and rare species of birds, fish, reptiles and indigenous plants.	Yes
1(b) i. The site is a large example of indigenous vegetation or habitat of indigenous fauna, or	The site is large enough to be ecologically viable. There are larger wetlands within the Whangaruru ED.	Yes
ii. Contains a combination of landform and indigenous vegetation and habitat of indigenous fauna, that is considered a good example of its type.	The site includes a sequence of saline, estuarine and palustrine vegetation types that provide habitat for a suite of birds, including 'threatened' and 'at risk' species.	Yes

2. Rarity / distinctiveness		**Yes**
2(a) The ecological site comprises indigenous ecosystems or indigenous vegetation types that:		
i. Are either Acutely or Chronically Threatened land environments (now know as Category 1 and 2) associated with LENZ Level 4; or	Part of the site is a Category 3 land environment.	No/Not Applicable
ii. Excluding wetlands, are now less than 20% of their original extent; or	The site is a wetland	Not Applicable
iii. Excluding man-made wetlands, are examples of the wetland classes that either otherwise trigger Appendix 5 criteria or exceed any of the following area:		
a) Saltmarsh greater than 0.5 hectare in area; or	0.5 hectares plus areas within the mangrove vegetation	
b) Shallow water (lake margins and rivers) greater than 0.5 hectare in area; or		Yes
c) Swamp greater than 0.4 hectare in area; or	1.9 hectares of raupo wetland	
d) Bog greater than 0.2 hectare in area; or		Yes
e) Wet Heathlands greater than 0.2 hectare in area; or		
f) Marsh; Fen; Ephemeral wetlands or Seepage / flush greater than 0.05 hectares in area.		
2(b) Indigenous vegetation or habitat of indigenous fauna that supports one or more indigenous taxa that are threatened, at risk, data deficient or uncommon, either nationally or at the relevant ecological scale.	The site is habitat for 'Threatened' or 'At Risk' taxa such as kiwi, Australasian bittern, fernbird, banded rail, spotless crake, Caspian tern, weka and Auckland green gecko.	Yes
2(c) The ecological site contains indigenous vegetation or an indigenous taxon that is:		
i. Endemic to the Northland-Auckland region; or	Auckland green gecko	Yes
ii. At its distributional limit within the Northland region;	The North Island weka reaches its current northern distributional limit on Russel Peninsula.	Yes

2(d) The ecological site contains indigenous vegetation or an association of indigenous taxa that: i. Is distinctive of a restricted occurrence; or ii. Is part of an ecological unit that occurs on an originally rare ecosystem; or iii. Is an indigenous ecosystem and vegetation type that is naturally rare or has developed as a result of an unusual environmental factor(s) that occur or are likely to occur in Northland; or iv. Is an example of nationally or regionally rare habitat as recognised in the New Zealand Marine Protected Areas Policy.	The site includes an association of indigenous taxa that is rare i.e. kiwi, weka and other 'threatened' or 'at risk' avifauna. It is not an originally rare ecosystem. The ecosystem is not naturally rare. No information found.	No No No
3. Diversity and pattern		**Yes**
3(a) Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of: i. Indigenous ecosystem or habitat types; or ii. Indigenous taxa;	The site contains a range of habitat types typical of the landform and hydrology. The site contains a high diversity of 'threatened' or 'at risk' avifauna.	Partially Partially
3(b) Changes in taxon composition reflecting the existence of diverse natural features or ecological gradients; or	refer to 3(c)	
3(c) Intact ecological sequences.	Sequence of estuarine and palustrine wetland types[4].	Yes

[4] The worksheet for the "Natural Character" assessment notes that the site is "part of a continuum of marine to terrestrial ecosystems" (refer to Section 3.2). Other sites that have been assessed for natural character may meet the significance criterion on this basis.

4. Ecological context		**Yes**
4(a) Indigenous vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function; or	The site links terrestrial, freshwater and estuarine habitats.	Yes
4(b) The ecological site plays an important hydrological, biological or ecological role in the natural functioning of riverine, lacustrine, palustrine, estuarine, plutonic (including karst), geothermal or marine system; or	The site plays a role in moderating discharges from the catchment, particularly during high rainfall events, and reducing sediment runoff into Uruti Bay. The bay is an important location for shellfish-gathering.	Yes
4(c) The ecological site is an important habitat for critical life history stages of indigenous fauna including breeding / spawning, roosting, nesting, resting, feeding, moulting, refugia or migration staging point (as used seasonally, temporarily or permanently).	The site may be a breeding location for indigenous, migratory species of freshwater fish. It is almost certainly a migratory pathway.	Probably

Table 2: A summary of the criteria for ecological significance in Appendix 5 of the Regional Policy Statement for Northland and an assessment of the part of Uruti Bay Wetland that lies within the "Coastal Marine Area" (CMA) south of Russell-Whakapara Road.

	Uruti Bay Wetland (Part within the CMA)	
Criteria	**Notes**	**Criterion met?**
1. Representativeness		**Yes**
1(a) i. The site comprises largely indigenous vegetation types; and	Dominated by mangroves with areas of indigenous saltmarsh vegetation.	Yes
ii. Is typical of what would have existed circa 1840; or	The vegetation is representative of that which would have occurred prior to 1840 but its extent may have been altered by changes in hydrology and surrounding landuses.	Yes
iii. Is represented by faunal assemblages in most of the guilds expected for the habitat type; or	The site is habitat for common and rare species of birds, fish and indigenous plants.	Yes
1(b) i. The site is a large example of indigenous vegetation or habitat of indigenous fauna, or	The site is large enough to be ecologically viable but there are more extensive mangrove ecosystems in Whangaruru ED.	Partially
ii. Contains a combination of landform and indigenous vegetation and habitat of indigenous fauna, that is considered a good example of its type.	This part of the site is dominated by mangrove vegetation with a narrow fringe of saltmarsh. The inland limit of the mangroves is artificially defined by a road on the its northern and eastern sides. However, it is habitat for a suite of fish and birds, including 'threatened' and 'at risk' species.	Partially
2. Rarity / distinctiveness		**Yes**
2(a) The ecological site comprises indigenous ecosystems or indigenous vegetation types that:		
i. Are either Acutely or Chronically Threatened land environments associated with LENZ Level 4; or	Not Applicable. The site is not classified.	Not Applicable
ii. Excluding wetlands, are now less than 20% of their original extent; or	The site is a wetland	Not Applicable
iii. Excluding man-made wetlands, are examples of the wetland classes that either otherwise trigger Appendix 5 criteria or exceed any of the following area		

a) Saltmarsh greater than 0.5 hectare in area; or b) Shallow water (lake margins and rivers) greater than 0.5 hectare in area; or c) Swamp greater than 0.4 hectare in area; or d) Bog greater than 0.2 hectare in area; or e) Wet Heathlands greater than 0.2 hectare in area; or f) Marsh; Fen; Ephemeral wetlands or Seepage / flush greater than 0.05 hectares in area.	The site does include saltmarsh vegetation but its total extent is probably less than 0.5 hectares.	
2(b) Indigenous vegetation or habitat of indigenous fauna that supports one or more indigenous taxa that are threatened, at risk, data deficient or uncommon, either nationally or at the relevant ecological scale.	The site is habitat of a 'Threatened' species (Caspian tern) and three 'At Risk species' (i.e. fernbird, weka and banded rail).	Yes
2(c) The ecological site contains indigenous vegetation or an indigenous taxon that is: i. Endemic to the Northland-Auckland region; or ii. At its distributional limit within the Northland region;	 The North Island weka reaches its current northern distributional limit on Russel Peninsula.	 No Yes
2(d) The ecological site contains indigenous vegetation or an association of indigenous taxa that: i. Is distinctive of a restricted occurrence; or ii. Is part of an ecological unit that occurs on an originally rare ecosystem; or iii. Is an indigenous ecosystem and vegetation type that is naturally rare or has developed as a result of an unusual environmental factor(s) that occur or are likely to occur in Northland; or iv. Is an example of nationally or regionally rare habitat as recognised in the New Zealand Marine Protected Areas Policy.	 It is not an originally rare ecosystem. The ecosystem is not naturally rare. No information found.	 No No No

3. Diversity and pattern		**No**
3(a) Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of: i. Indigenous ecosystem or habitat types; or ii. Indigenous taxa;	 The area is predominantly one ecosystem/habitat type (i.e. mangrove wetland). Habitat for relatively common species that are typical of the ecosystem type but also habitat for 'threatened' and 'at risk' avifauna.	 No Partially
3(b) Changes in taxon composition reflecting the existence of diverse natural features or ecological gradients; or	refer to 3(c)	
3(c) Intact ecological sequences.	The inland limit of the mangroves is artificially defined by a road on the its northern and eastern sides	No
4. Ecological context		**Yes**
4(a) Indigenous vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function; or	The area provides a link to estuarine and freshwater habitats on the north side of Russell-Whakapara Road.	Yes
4(b) The ecological site plays an important hydrological, biological or ecological role in the natural functioning of riverine, lacustrine, palustrine, estuarine, plutonic (including karst), geothermal or marine system; or	Mangroves trap sediment and this area probably plays a role in reducing sediment runoff into Uruti Bay. The bay is an important location for shellfish-gathering.	Yes
4(c) The ecological site is an important habitat for critical life history stages of indigenous fauna including breeding / spawning, roosting, nesting, resting, feeding, moulting, refugia or migration staging point (as used seasonally, temporarily or permanently).	The site is a migratory pathway for indigenous species of freshwater fish.	Probably

6. Conclusions

Uruti Bay Wetland (*c.*7.7 hectares) comprises three main vegetation types that represent an ecological sequence extending across estuarine and palustrine habitats. The vegetation types are: mangrove scrub and forest (*c.*5.3 ha), oioi-dominated saltmarsh (*c.*0.5 ha) and raupo-dominated freshwater wetland (*c.*1.9 ha).

The site provides habitat for a suite of native flora and fauna, including species that are classified as 'Threatened' or 'At Risk'. Two species are classified as 'Threatened' (Australasian bittern, Caspian tern) and five are 'At Risk' (kiwi, fernbird, banded rail, spotless crake, Auckland green gecko). Other native fauna that are not threatened include birds (tui, grey warbler/riro, fantail/piwakawaka), freshwater fishes (e.g. banded kokopu, shortfin eel) and estuarine fishes (e.g. flounder, yellow-eyed mullet, kahawai).

The site was assessed against the criteria for ecological significance set out in the Regional Policy Statement. A site is regarded as significant if it meets one or more the criteria. Uruti Bay Wetland was found to meet all four criteria.

The part of Uruti Bay Wetland that lies south of Russell Whakapara Road is within the "Coastal Marine Area". This part of the site was assessed separately and was found to meet three of the criteria set out in the Regional Policy Statement.

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Appendix One: Photographs

Plate 1: An Australasian bittern (Matuku) on the edge of Uruti Bay Wetland. The verge of Uruti Road is in the foreground (Photo credit: K. Russell 2011).

Plate 2: A banded rail in Uurit Bay Wetland near the Uruti Road causeway (Photo credit: E Harwood 2019).

Plate 3: Uruti Bay Wetland includes three main vegetation types: mangrove scrub and forest (at right of frame), oioi-dominated saltmarsh (in the foreground at left of frame) and raupo-dominated freshwater wetland (in the rear at left of frame).

Plate 4: Saltmarsh on the margin of mangrove scrub next to Russell-Whakapara Road.

Plate 5: The estuarine channel on the south side of Russell-Whakapara Road showing mangrove forest and saltmarsh.

Plate 6: Oioi saltmarsh grading into mangrove scrub.

Appendix Two: Native vascular flora

Ferns and fern allies	
Dicksonia squarrosa	wheki
Histiopteris incisa	water fern, matata
Parablechnum novae-zelandiae	kiokio
Pteridium esculentum	bracken
Dicotyledons (including trees, shrubs, herbs and climbers)	
Avicennia marina subsp. australasica	mangrove
Coprosma rhamnoides	
Coprosma robusta	karamu
Galium palustre	marsh bedstraw
Geniostoma ligustrifolium var. *ligustrifolium*	hangehange
Kunzea robusta	kanuka
Leptospermum scoparium agg.	manuka
Melicytus ramiflorus	mahoe
Myrsine australis	mapou
Plagianthus divaricatus	saltmarsh ribbonwood
Salicornia quinqueflora	glasswort
Monocotyledons (including rushes sedges and grasses)	
Apodasmia similis	oioi
Carex lessoniana	
Cordyline australis	ti kouka, cabbage tree
Cyperus ustulaus	giant umbrella sedge
Dianella nigra	turutu
Isachne globosa	swamp millet
Isolepis cernua	
Isolepis prolifera	
Juncus kraussii subsp. australiensis	sea rush
Lepidosperma laterale	
Machaerina juncea	
Machaerina rubiginosa	
Machaerina teretifolia	
Phormium tenax	harakeke, flax
Schoenoplectus tabernaemontani	kuta
Typha orientalis	raupo

Appendix Three: Introduced vascular flora

Introduced vascular plants ("weeds")	
Acacia mearnsii	black wattle
Cenchrus clandestinus	kikuyu grass
Cortaderia selloana	pampas
Delairea odorata	German ivy
Hedychium gardnerianum	wild ginger
Nasturtium sp.	watercress
Paspalum dilatatum	paspalum
Passiflora sp.	passionfruit
Rubus fruticosus agg.	blackberry
Solanum mauritianum	tobacco weed, woolly nightshade
Tradescantia fluminensis	tradescantia, wandering jew
Tropaeolum majus	nasturtium
Ulex europaeus	gorse

Appendix Four: Significance Criteria

Criteria for identifying areas of significant indigenous vegetation and significant habitats of indigenous fauna in terrestrial, freshwater and marine environments (Appendix 5 of the Regional Policy Statement for Northland).

An area of indigenous vegetation or habitat(s) of indigenous fauna is significant if it meets one or more of the following criteria:

1. Representativeness

(a) Regardless of its size, the ecological site is largely indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity at the relevant and recognised ecological classification and scale to which the ecological site belongs:

i. If the ecological site comprises largely indigenous vegetation types; and
ii. Is typical of what would have existed circa 1840; or
iii. Is represented by faunal assemblages in most of the guilds expected for the habitat type; or

(b) The ecological site

i. Is a large example of indigenous vegetation or habitat of indigenous fauna, or
ii. Contains a combination of landform and indigenous vegetation and habitat of indigenous fauna, that is considered to be a good example of its type at the relevant and recognised ecological classification and scale.

2. Rarity / distinctiveness

(a) The ecological site comprises indigenous ecosystems or indigenous vegetation types that:

i. Are either Acutely or Chronically Threatened land environments associated with LENZ Level 4); or
ii. Excluding wetlands, are now less than 20% of their original extent; or
iii. Excluding man-made wetlands, are examples of the wetland classes that either otherwise trigger Appendix 5 criteria or exceed any of the following area
a) Saltmarsh greater than 0.5 hectare in area; or
b) Shallow water (lake margins and rivers) greater than 0.5 hectare in area; or
c) Swamp greater than 0.4 hectare in area; or
d) Bog greater than 0.2 hectare in area; or
e) Wet Heathlands greater than 0.2 hectare in area; or
f) Marsh; Fen; Ephemeral wetlands or Seepage / flush greater than 0.05 hectares in area.

(b) Indigenous vegetation or habitat of indigenous fauna that supports one or more indigenous taxa that are threatened, at risk, data deficient or uncommon, either nationally or at the relevant ecological scale.

(c) The ecological site contains indigenous vegetation or an indigenous taxon that is:

i. Endemic to the Northland-Auckland region; or
ii. At its distributional limit within the Northland region;

(d) The ecological site contains indigenous vegetation or an association of indigenous taxa that:

i. Is distinctive of a restricted occurrence; or
ii. Is part of an ecological unit that occurs on an originally rare ecosystem; or
iii. Is an indigenous ecosystem and vegetation type that is naturally rare or has developed as a result of an unusual environmental factor(s) that occur or are likely to occur in Northland; or
iv. Is an example of nationally or regionally rare habitat as recognised in the New Zealand Marine Protected Areas Policy.

3. Diversity and pattern

(a) Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of:

i. Indigenous ecosystem or habitat types; or
ii. Indigenous taxa;

(b) Changes in taxon composition reflecting the existence of diverse natural features or ecological gradients; or
(c) Intact ecological sequences.

4. Ecological context

(a) Indigenous vegetation or habitat of indigenous fauna is present that provides or contributes to an important ecological linkage or network, or provides an important buffering function; or
(b) The ecological site plays an important hydrological, biological or ecological role in the natural functioning of riverine, lacustrine, palustrine, estuarine, plutonic (including karst), geothermal or marine system; or
(c) The ecological site is an important habitat for critical life history stages of indigenous fauna including breeding / spawning, roosting, nesting, resting, feeding, moulting, refugia or migration staging point (as used seasonally, temporarily or permanently).

Assessment of twelve sites of "High Natural Character" against the criteria for ecological significance in the Regional Policy Statement

These assessments were undertaken using only the information included in the natural character worksheet. No other published or unpublished information (including aerial photographs) was used. The worksheet was used to identify ecological significance criteria that are probably or possibly met by each site (subject to further investigations and/or site inspection). For each of the assessed sites, contiguous areas of high natural character are recorded in the final column.

Notes:

Criterion 2: this could not be assessed because the required information was beyond the scope of the natural character assessments and, therefore, not included in the worksheet i.e. the worksheets do not include the extent of wetland vegetation, LENZ classifications (for terrestrial sites) or information about 'threatened' or 'at risk' taxa. For the former, this could be addressed by using aerial photographs to map vegetation types (with some ground-truthing).

Criterion 4: It is at least possible (and reasonably "probable") that all of the sites met this criterion because:

- mangroves, estuarine wetlands and freshwater wetlands buffer the marine habitat from sediment and stormwater runoff from land,
- these habitats also buffer terrestrial habitats from storm surges, and
- most of NZ's native freshwater fish migrate between freshwater and estuarine environments. Therefore, stream mouths, intertidal channels and wetlands are critical to the life history of freshwater fish.

					Assessment against RPS Criteria		
Number *SBAs	Site Name	Score	Rank	RPS (Notes from Worksheet)	Probable	Possible	Contiguous site(s)
115/14	Upper Mangonui Harbour	0.61	H	River and wetlands on Oruati River & Tokatoka Stream to the west of the Kohumaru Rd causeway. Includes mangrove shrubland & forest with some saltmarsh and channels. Some local patches of raupo freshwater wetland. Indigenous vegetation without pest plants, close to present potential cover for site conditions. Part of a continuum of marine to terrestrial ecosystems.	1a (Close to present potential cover) 1b (Combination of vegetation & habitat & a good example of its type) 3c (Continuum)	4 (buffering, critical life history stages)	**115/1:** Extensive area of mangrove shrubland & shrubland & oioi dominated saltmarsh associated with Oruaiti River. Some freshwater wetland areas (raupo-manuka & other native shrubs). Part of a continuum of marine to terrestrial ecosystems.
119/37	near Ota Pt, Whangaroa Harbour	0.57	H	Mangrove forest and shrubland with small area intertidal flats. Some cutting of mangroves for access and grazing. Indigenous vegetation without pest plants, close to present potential cover for site conditions.	1a (Close to present potential cover)	4 (buffering, critical life history stages)	N/A
03/06	Takou Bay	0.51	H	Intertidal flats and channel, mangroves &	1a (Largely	4 (buffering,	**03/09**: Low dunes and two spits. Mobile river

					Assessment against RPS Criteria		
Number *SBAs	Site Name	Score	Rank	RPS (Notes from Worksheet)	Probable	Possible	Contiguous site(s)
				patches of saltmarsh. Indigenous vegetation without pest plants (mangroves & saltmarsh). Includes a sequence of ecosystems. Largely indigenous cover.	indigenous) 1b (Combination of vegetation & habitat & a good example of its type) 3c (Sequence)	critical life history stages)	mouth. No marram observed. Vegetation cover is dominated by spinifex. High densities of dotterel in breeding season (up to 40 pairs).
04/26	Northeast Te Puna Inlet	0.49	H	Saltmarsh & mangrove scrub & forest.		1b (Combination of vegetation & habitat & a good example of its type) 4 (buffering, critical life history stages)	N/A
08/15	Uruti Bay	0.56	H	Mangroves. Upstream of mangroves, limited area of oioi saltmarsh and a two-armed freshwater wetland. Largely indigenous vegetation with few pest plants. Continuum mangroves, saltmarsh to freshwater wetland. Part of a continuum of marine to terrestrial ecosystems.	1a (Largely indigenous) 1b (Combination of vegetation & habitat & a good example of its type) 3c (Continuum)	4 (buffering, critical life history stages)	N/A
08/30	Te Wahapu	0.46	H	Kanuka dominant scrub & forest with broadleaved species in some gullies. Some wilding pines. Patches of more mature podocarp-broadleaved forest (totara- puriri-taraire). Relatively large block of largely indigenous vegetation with relatively few pest plants. Unit links to freshwater wetland, mangroves and the harbour so part of a continuum of marine to terrestrial ecosystems.	1a (Largely indigenous) 3c (Continuum)	1b (Combination of vegetation & habitat & a good example of its type) 4 (buffering, critical life history stages)	**08/32** Freshwater wetland in valley floor. Part of a continuum mangroves to freshwater wetland & regenerating indigenous forest. **08/31** Indigenous vegetation (mangroves) that is part of a continuum through freshwater wetland to regenerating (and small area relatively mature) forest. **09/82** totara-mixed broadleaved-kanuka forest and small area of kanuka dominant forest and scrub, with mature pohutukawa on coastal fringe. Largely indigenous vegetation with few pest plants, with some relatively mature forest. Part of a continuum of marine to terrestrial ecosystems. **09/80** Kanuka dominant forest with some wilding pines; mixed broadleaved forest with native conifers of outstanding natural

					Assessment against RPS Criteria		
Number *SBAs	Site Name	Score	Rank	RPS (Notes from Worksheet)	Probable	Possible	Contiguous site(s)
							character. Largely indigenous vegetation with relatively few pest plants.
09/35*	Kawakawa River	0.56	H	Mangroves and saltmarsh on true left bank on an inside bend of the Kawakawa River. Indigenous vegetation without pest plants, close to present potential cover for site conditions. Part of a continuum of marine to terrestrial ecosystems. Few obvious human structures.	1a (Close to present potential cover) 1b (Combination of vegetation & habitat & a good example of its type) 3c (Continuum)	4 (buffering, critical life history stages)	N/A (09/34 is across the river)
36/40*	Mangawhai	0.53	H	Inlet cut off by the Molesworth Drive causeway (1970's). Mangrove scrub, saltmarsh, channel & intertidal flats (including flood tide delta). Indigenous vegetation without pest plants, close to present potential cover for site conditions, although some expansion of vegetation possible as sedimentation will continue. Water quality affected by additional nutrient and fine sediment from catchment.	1a (Close to present potential cover) 1b (Combination of vegetation & habitat & a good example of its type)	4 (buffering, critical life history stages)	**36/45** Relatively extensive area of mangrove scrub & saltmarsh, two channels and some limited freshwater wetland. **36/35** Saltmarsh & associated woody wetland (oioi, native shrubs) with low mangrove shrubland upstream of road causeway.
36/45*	Mangawhai	0.56	H	Relatively extensive area of mangrove scrub & saltmarsh, two channels and some limited freshwater wetland. The perimeter is largely stopbanked with floodgates. Indigenous vegetation without pest plants, close to present potential cover	1a (Close to present potential cover)	1bi (Extensive area) 1bii (Combination of vegetation & habitat & a good example of its type) 4 (buffering, critical life history stages)	**36/39** mangrove scrub & saltmarsh. Some manuka dominant scrub in ecotone from saltmarsh to land. Includes intertidal flats and channels. Links to **36/40** Mangrove scrub, saltmarsh, channel & intertidal flats (including flood tide delta). Indigenous vegetation without pest plants.
68/01	Omanaia River	0.53	H	Mangroves & channel with limited areas of saltmarsh & intertidal flats. Indigenous vegetation without pest plants.		1a (Indigenous vegetation without pest plants) 1b (Combination of	**69/22** Oue Creek with channels & mangroves. Includes small area of grazed native forest on riparian faces (totara-puriri-kanuka forest with kowhai & occasional emergent kahikatea). **66/11** (Hokianga Harbour) subtidal reefs and flats, and intertidal flats. **69/21** Mangrove scrub & forest

					Assessment against RPS Criteria		
Number *SBAs	Site Name	Score	Rank	RPS (Notes from Worksheet)	Probable	Possible	Contiguous site(s)
						vegetation & habitat & a good example of its type) 4 (buffering, critical life history stages)	(latter fringing river), channel & limited intertidal flats which is contiguous with **69/19** Low coastal margins & hill slopes adjoining mangroves. Predominantly manuka-kanuka dominant scrub with young emergent native conifers (tanekaha, totara) & some wilding pines. Patches of rimu- totara forest. Part of a continuum of indigenous ecosystems from marine to terrestrial.
69/14*	Waima River	0.47	H	Mangrove scrub & forest, intertidal flats and channels and some saltmarsh (in at least one arm). With high levels sediment deposition conditions are becoming more suitable for saltmarsh. Largely indigenous cover and infauna (intertidal flats and channels).	1a (Largely indigenous) 1b (Combination of vegetation & habitat & a good example of its type)	4 (buffering, critical life history stages)	**66/11** (Hokianga Harbour) subtidal reefs and flats, and intertidal flats. **69/11** Riparian, on true left bank of Waima River adjoining mangroves. Kanuka-manuka forest with emergent totara. Some small mixed broadleaved forest patches. Indigenous forest, some relatively mature. Part of a continuum of indigenous ecosystems from marine to terrestrial. **69/15** True left bank. Downstream there is a narrow band of fringing totara-mixed broadleaved (pohutukawa, puriri) -kanuka forest. There is a large tall pine. A wider area upstream consists of scattered rimu-kahikatea/mixed broadleaved (puriri)- kanuka forest with some damage. Part of a continuum of indigenous ecosystems from marine to terrestrial.
78/17	Whangape Harbour	0.49	H	Extensive areas of intertidal flats, mangroves & saltmarsh. Harbour virtually empties at spring low tides & has a very large catchment (approx 70% in agriculture) relative to the small size of the Harbour. Extent of mangroves has increased from 284ha in 1939 to 368ha in 1993. Largely indigenous cover and infauna (intertidal flats and channels). Indigenous vegetation without pest plants (mangroves & saltmarsh). Part of a continuum of indigenous ecosystems from marine to terrestrial.	1a (Largely indigenous) 1b (Combination of vegetation & habitat & a good example of its type) 3c (Continuum)	1bi (Extensive areas)	**79/17** (Awaroa River channel, intertidal flats, mangroves, & saltmarsh in upper reaches) which is contiguous with **79/20** (Hill slopes predominantly with kanuka-manuka scrub & low forest (with an occasional wilding pine). Upstream areas include younger native conifers -mixed broadleaved -kanuka forest. Part of a continuum of indigenous ecosystems from marine to terrestrial), **79/14** (Riparian faces with a core (70%) of native conifers-mixed broadleaved-kanuka forest; manuka-kanuka scrub & low forest on the margins), **79/11** (Hill slopes with kanuka-manuka scrub & low forest and the occasional small group of wilding pines. Inland valleys contain native conifers (mainly kahikatea)-mixed broadleaved -kanuka forest.). **79/01** (Large mangrove and saltmarsh unit with intertidal flats and some channels. Part of a continuum of indigenous

					Assessment against RPS Criteria		
Number *SBAs	Site Name	Score	Rank	RPS (Notes from Worksheet)	Probable	Possible	Contiguous site(s)
							ecosystems from marine to terrestrial). **78/10** (South Head coastal cliffs and faces with native scrub (mainly manuka-kanuka); native shrubs with introduced grasses; and gully kanuka-mixed broadleaved scrub & forest) which is contiguous with **78/11** (Hill slopes with native conifer -mixed broadleaved forest and smaller patches with kanuka-mixed broadleaved scrub & forest), **78/13** (Relatively mature native forest inland and on the steep faces. This is mainly kauri-podocarp/mixed broadleaved forest. The rest of the unit is regenerating native forest that is a mosaic of kanuka dominant scrub & forest with mixed broadleaved species & some native conifers).

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Ecological assessments of six sites of "High Natural Character"

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Contents

1. Introduction

Some natural areas in the Coastal Environment of Northland Region have not been assessed for ecological significance using the full set of criteria included in Appendix 5 of the Regional Policy Statement (RPS). As a consequence, they have not been identified as "Significant Ecological Areas" or "Significant Bird Areas" in the Proposed Regional Plan. Some of these natural areas have been identified as sites with High Natural Character values.

The purposes of this report are to determine if:

- sites with "High Natural Character" may also meet the criteria for ecological significance, and if
- the natural character assessment worksheet can be used to inform the ecological assessment (in relation to the criteria in the RPS), and if
- there are other online databases or information sources that can also be used to identify sites that meet the criteria for ecological significance.

This report assesses the ecological significance of six sites of "High Natural Character" at five locations using the natural character assessment worksheet, aerial photographs, Threatened Environment Classification and advice from local fauna practitioners.

2. Methods

Six sites of "High Natural Character" were assessed against the criteria for ecological significance in the Regional Policy Statement using information from:

- the natural character assessment worksheet,
- aerial photographs,
- Threatened Environment Classifications,
- Advice and observations from skilled fauna practitioners associated with local conservation projects and/or conservation groups, and
- The way criterion 4 was applied to sites that are identified as "Significant Ecological Areas" in the Proposed Regional Plan.

The "High Natural Character" sites that were assessed are:

- 08/15 Uruti Bay Wetland: Estuarine and palustrine wetlands. Most of the site is in the Coastal Marine Area (CMA).
- 08/23 Orongo Bay: Estuarine and almost entirely within the CMA.
- 08/31 Te Wahapu: Estuarine, within the CMA.
- 08/32 Te Wahapu: Palustrine wetland contiguous with 08/31 but inland of the CMA and not included in the Proposed Regional Plan.
- 09/83 Pipiroa/Okiato: Estuarine and palustrine wetlands partially within the CMA. No part of this site is included in the proposed Regional Plan.
- 10/07 Mid-Waikare (also known as "Frenchman's Swamp"): Estuarine and palustrine wetland almost entirely within the CMA.

The completed assessment sheets are included in **Appendices 1 -5**.

The locations of the sites are shown in **Figures 1 - 3**.

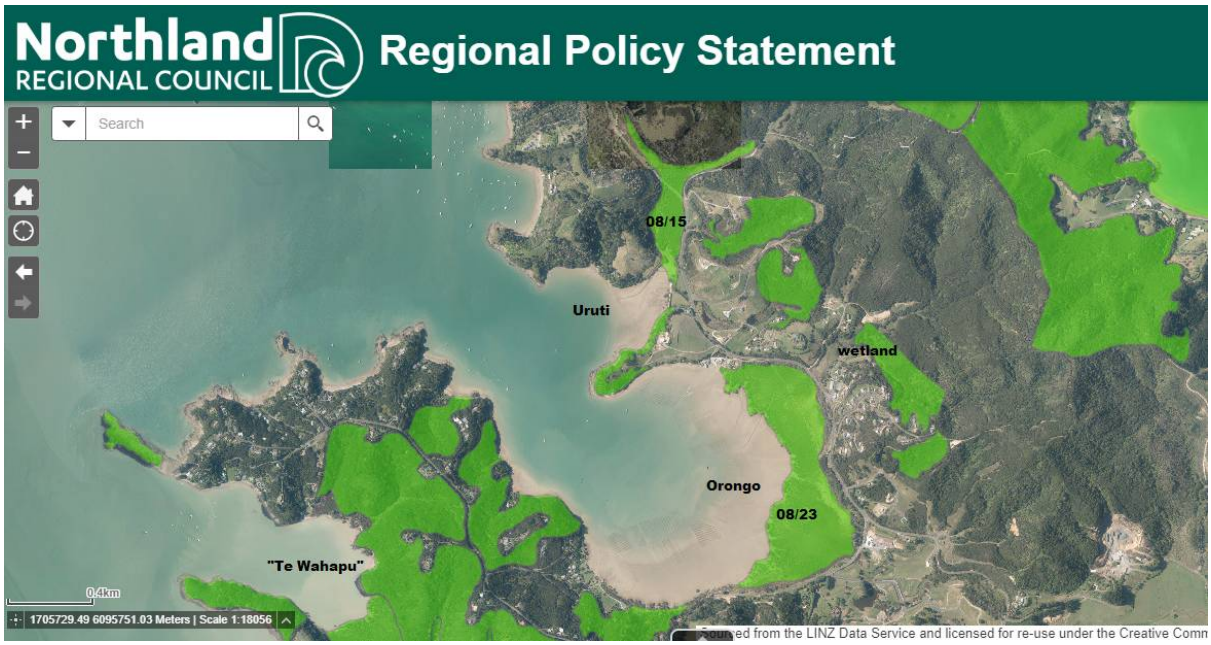

Figure 1: Locations of sites of High Natural Character in Uruti Bay (08/15) and Orongo Bay (08/23).

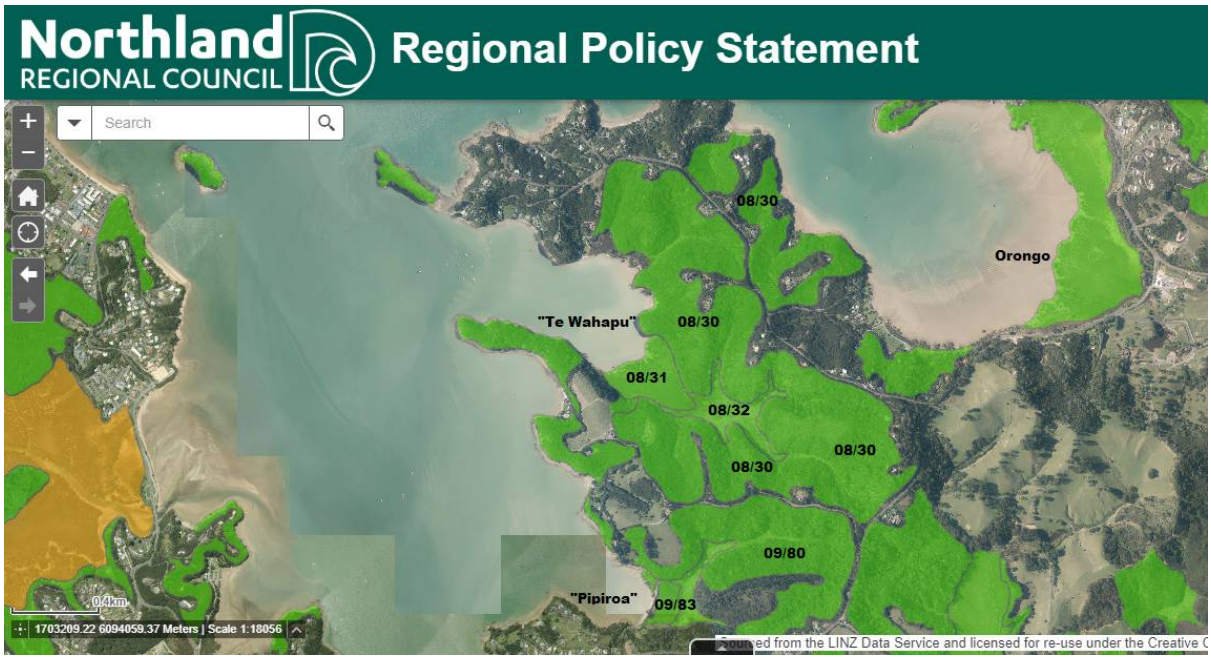

Figure 2: Locations of sites of High Natural Character at Te Wahapu (08/31, 08/32) and Pipiroa (09/83)

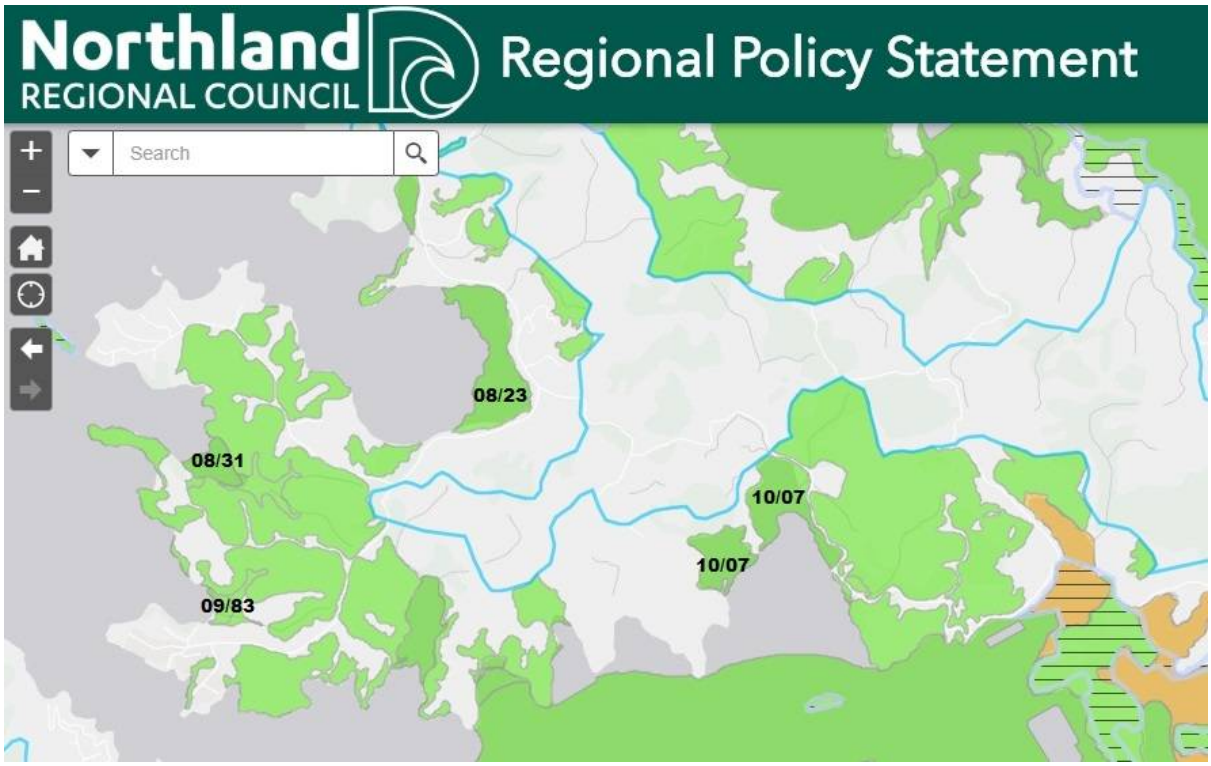

Figure 3: Locations of sites of High Natural Character at Orongo Bay (08/23), Te Wahapu (08/31), Pipiroa (09/83) and Frenchman's Swamp (10/07).

3. Findings

- All six sites of High Natural Character meet the criteria for ecological significance (refer to Table 1 and the Appendices).
- The natural character worksheets assisted in assessing criteria 1(a), 1(b), 3(a) and 3(c).
- The Threatened Land Environments Classification enabled some sites to be assessed against criterion 2(a)(i).
- Aerial photographs enabled criterion 2(ii) to be assessed and contributed to assessments against Criteria 3 and 4.
- Fauna information provided by local practitioners contributed to assessments against Criteria 2, 3 and 4.
- The Significant Ecological Area worksheets provided guidance that enabled criterion 4 to be assessed consistently in comparison to mapped "Significant Ecological Areas" in the Proposed Regional Plan.

Table 1: Assessments of sites of High Natural Character against the criteria for ecological significance (Appendix 5, Regional Policy Statement for Northland).

Criteria	Criterion met?				
	Uruti	Orongo	Te Wahapu Estuary/Wetland	Pipiroa	Frenchman's Swamp
1. Representativeness					
1(a) i. The site comprises largely indigenous vegetation types; and	Yes	Yes	Yes	Yes	Yes
ii. Is typical of what would have existed circa 1840; or	Yes	Yes	Yes	Yes	Yes
iii. Is represented by faunal assemblages in most of the guilds expected for the habitat type; or	Yes	Yes	Yes	Yes	Yes
1(b) i. The site is a large example of indigenous vegetation or habitat of indigenous fauna, or	Yes	Yes	Yes	Yes	Yes
ii. Contains a combination of landform and indigenous vegetation and habitat of indigenous fauna, that is considered a good example of its type.	Yes	Yes	Yes	Yes	Yes
2. Rarity / distinctiveness					
(a) The ecological site comprises indigenous ecosystems or indigenous vegetation types that:					
i. Are either Acutely or Chronically Threatened land environments (now know as Category 1 and 2) associated with LENZ Level 4; or	N/A	Yes	Yes	Yes	N/A
ii. Excluding wetlands, are now less than 20% of their original extent; or	N/A	N/A	N/A	N/A	N/A
iii. Excluding man-made wetlands, are examples of the wetland classes that either otherwise trigger Appendix 5 criteria or exceed any of the following area: a) Saltmarsh greater than 0.5 hectare in area; or	Yes	Yes	Yes	Yes	Yes
b) Shallow water (lake margins and rivers) greater than 0.5 hectare in area; or	Yes	Yes	Yes	Yes	

c) Swamp greater than 0.4 hectare in area; or d) Bog greater than 0.2 hectare in area; or e) Wet Heathlands greater than 0.2 hectare in area; or f) Marsh; Fen; Ephemeral wetlands or Seepage / flush greater than 0.05 hectares in area.					
2(b) Indigenous vegetation or habitat of indigenous fauna that supports one or more indigenous taxa that are threatened, at risk, data deficient or uncommon, either nationally or at the relevant ecological scale.	Yes	Yes	Yes	Yes	Yes
2(c) The ecological site contains indigenous vegetation or an indigenous taxon that is: i. Endemic to the Northland-Auckland region; or ii. At its distributional limit within the Northland region;	Yes Yes	 Yes	 Yes	Yes Yes	 Yes
2(d) The ecological site contains indigenous vegetation or an association of indigenous taxa that: i. Is distinctive of a restricted occurrence; or ii. Is part of an ecological unit that occurs on an originally rare ecosystem; or iii. Is an indigenous ecosystem and vegetation type that is naturally rare or has developed as a result of an unusual environmental factor(s) that occur or are likely to occur in Northland; or iv. Is an example of nationally or regionally rare habitat as recognised in the New Zealand Marine Protected Areas Policy.	Yes	Yes	Yes	Yes	
3. Diversity and pattern					
3(a) Indigenous vegetation or habitat					

of indigenous fauna that contains a high diversity of: i. Indigenous ecosystem or habitat types; or ii. Indigenous taxa;	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
3(b) Changes in taxon composition reflecting the existence of diverse natural features or ecological gradients; or	refer to 3(c)	refer to 3(c)	refer to 3(c)	refer to 3(c)	refer to 3(c)
3(c) Intact ecological sequences.	Yes	Yes	Yes	Yes	Yes
4. Ecological context					
4(a) Indigenous vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function; or	Yes	Yes	Yes	Yes	Yes

4(b) The ecological site plays an important hydrological, biological or ecological role in the natural functioning of riverine, lacustrine, palustrine, estuarine, plutonic (including karst), geothermal or marine system; or	Yes	Yes	Yes	Yes	Yes
4(c) The ecological site is an important habitat for critical life history stages of indigenous fauna including breeding / spawning, roosting, nesting, resting, feeding, moulting, refugia or migration staging point (as used seasonally, temporarily or permanently).	Yes	Yes	Yes	Yes	Yes

Appendix One: Assessment of Uruti Bay Wetland (site of High Natural Character 08/15 and part of Site Q05001 in Whangaruru ED).

	Uruti Bay Wetland (08/15)	
Appendix 5 Criteria	**Notes**	**Criterion met?**
1. Representativeness		**Yes**
1(a) i. The site comprises largely indigenous vegetation types; and	Indigenous wetland vegetation and intertidal flats with areas of seagrass. Largely indigenous vegetation with few pest plants. (**Natural Character Assessment**).	Yes
ii. Is typical of what would have existed circa 1840; or	The vegetation is representative of that which would have occurred prior to 1840.	Yes
iii. Is represented by faunal assemblages in most of the guilds expected for the habitat type; or	The site is habitat for common and rare species of birds, fish, reptiles and indigenous plants (i.e.,seagrass, mangroves, saltmarsh and raupo wetland). The intertidal flats beyond the mapped site support important shellfish beds (cockles, pipi/ kokota), oysters. Fish species include migratory freshwater fish, mullet, kahawai, kingfish and snapper.	Yes
1(b) i. The site is a large example of indigenous vegetation or habitat of indigenous fauna, or	The site is large enough to be ecologically viable.	Yes
ii. Contains a combination of landform and indigenous vegetation and habitat of indigenous fauna, that is considered a good example of its type.	Mangroves, oioi saltmarsh and freshwater wetland dominated by raupo with some native shrubs (N**atural Character Assessment**). Habitat for a suite of indigenous fauna (fish, avifauna and reptiles).	Yes
2. Rarity / distinctiveness		**Yes**
2(a) The ecological site comprises indigenous ecosystems or indigenous vegetation types that:		
i. Are either Acutely or Chronically Threatened land environments (now know as Category 1 and 2) associated with LENZ Level 4; or	Part of the site is a Category 3 land environment.	
ii. Excluding wetlands, are now less than 20% of their original extent; or	The site is a wetland	N/A
iii. Excluding man-made wetlands, are examples of the wetland classes that either otherwise trigger Appendix 5 criteria or exceed any of the following area:		

a) Saltmarsh greater than 0.5 hectare in area; or b) Shallow water (lake margins and rivers) greater than 0.5 hectare in area; or c) Swamp greater than 0.4 hectare in area; or d) Bog greater than 0.2 hectare in area; or e) Wet Heathlands greater than 0.2 hectare in area; or f) Marsh; Fen; Ephemeral wetlands or Seepage / flush greater than 0.05 hectares in area.	0.5 hectares plus areas within the mangrove vegetation 1.9 hectares of raupo wetland	Yes Yes
2(b) Indigenous vegetation or habitat of indigenous fauna that supports one or more indigenous taxa that are threatened, at risk, data deficient or uncommon, either nationally or at the relevant ecological scale.	The site is habitat for 'Threatened' or 'At Risk' taxa such as kiwi, Australasian bittern, fernbird, banded rail, spotless crake, weka and Auckland green gecko. The adjacent intertidal area, outside the mapped site boundary, is habitat for Caspian tern, , kotuku, reef heron, shellfish beds and seagrass.	Yes
2(c) The ecological site contains indigenous vegetation or an indigenous taxon that is: i. Endemic to the Northland-Auckland region; or ii. At its distributional limit within the Northland region;	Auckland green gecko The North Island weka reaches its current northern distributional limit on Russell Peninsula.	Yes Yes
2(d) The ecological site contains indigenous vegetation or an association of indigenous taxa that: i. Is distinctive of a restricted occurrence; or ii. Is part of an ecological unit that occurs on an originally rare ecosystem; or iii. Is an indigenous ecosystem and vegetation type that is naturally rare or has developed as a result of an unusual environmental factor(s) that occur or are likely to occur in Northland; or iv. Is an example of nationally or regionally rare habitat as recognised in	The site includes an association of indigenous taxa that is rare i.e. kiwi, weka and other 'threatened' or 'at risk' avifauna. The intertidal flats adjacent to the site support shellfish beds that are one of the most important on the Russell Peninsula and intertidal seagrass beds.	Yes

the New Zealand Marine Protected Areas Policy.		
3. Diversity and pattern		**Yes**
3(a) Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of: i. Indigenous ecosystem or habitat types; or ii. Indigenous taxa;	 The site contains a range of habitat types typical of the landform and hydrology. The site contains a high diversity of 'threatened' or 'at risk' avifauna.	 Yes Yes
3(b) Changes in taxon composition reflecting the existence of diverse natural features or ecological gradients; or	refer to 3(c)	
3(c) Intact ecological sequences.	Sequence of intertidal, estuarine and palustrine Habitats. The **Natural Character assessment** notes that the site is "part of a continuum of marine to terrestrial ecosystems".	Yes
4. Ecological Context		**Yes**
4(a) Provides or contributes to an important ecological linkage or network or buffering function.	The site links terrestrial, freshwater and estuarine habitats. The vegetation buffers estuarine environments from sediment runoff and terrestrial environments from storm surges, sea level rise etc and consequent erosion. "Mangroves and saltmarsh play important buffering and ecological role in estuary" (Waikino & Te Haumi SEA Assessments).	Yes
4(b) important hydrological, biological or ecological role in the functioning of riverine, lacustrine or palustrine systems.	The site plays a role in moderating discharges from the catchment, particularly during high rainfall events, and reducing sediment runoff into Uruti Bay. It has important biological and ecological roles as a habitat for suites of native fauna and flora. The bay is an important location for shellfish-gathering. "Shellfish beds, mangroves and saltmarsh play important buffering and ecological role in estuary" (Waikino & Te Haumi SEA Assessments).	Yes
4(c) important habitat for critical life history stages of indigenous fauna.	The site may be a breeding location for indigenous, migratory species of freshwater fish. It is almost certainly a migratory pathway. "Provides support for various life stages of benthic invertebrates, shorebirds and nursery for coastal fish species" (Waikino & Te Haumi SEA Assessments).	Yes

Appendix Two: Assessment of Orongo Bay (site of High Natural Character 08/23 and part of Site Q05001 in Whangaruru ED) and the contiguous freshwater wetland.

	Orongo Bay (08/23) & freshwater wetland	
Criteria	**Notes**	**Criterion met?**
1. Representativeness		**Yes**
1(a) i. The site comprises largely indigenous vegetation types; and	Mangroves, saltmarsh and raupo-dominant freshwater wetland. The **Natural Character Assessment** describes site 08/23 as "indigenous vegetation without pest plants"	Yes
ii. Is typical of what would have existed circa 1840; or	The **Natural Character Assessment** records the site is "close to present potential cover".	Yes
iii. Is represented by faunal assemblages in most of the guilds expected for the habitat type; or	Habitat for indigenous plants, freshwater fish, estuarine fish and avifauna.	Yes
1(b) i. The site is a large example of indigenous vegetation or habitat of indigenous fauna, or	The site is large enough to be ecologically viable.	Yes
ii. Contains a combination of landform and indigenous vegetation and habitat of indigenous fauna, that is considered a good example of its type.	The site includes a sequence of estuarine and palustrine vegetation that provides habitat for a suite of indigenous fauna (shellfish, fish and avifauna).	Yes
2. Rarity / distinctiveness		**Yes**
2(a) The ecological site comprises indigenous ecosystems or indigenous vegetation types that:		
i. Are either Acutely or Chronically Threatened land environments (now known as Category 1 and 2) associated with LENZ Level 4; or	The palustrine wetland inland of the CMA is a Category 2 land environment.	
ii. Excluding wetlands, are now less than 20% of their original extent; or	The site is a wetland	N/A
iii. Excluding man-made wetlands, are examples of the wetland classes that either otherwise trigger Appendix 5 criteria or exceed any of the following area: a) Saltmarsh greater than 0.5 hectare in	>0.5 hectares	Yes

area; or b) Shallow water (lake margins and rivers) greater than 0.5 hectare in area; or c) Swamp greater than 0.4 hectare in area; or d) Bog greater than 0.2 hectare in area; or e) Wet Heathlands greater than 0.2 hectare in area; or f) Marsh; Fen; Ephemeral wetlands or Seepage / flush greater than 0.05 hectares in area.	>1 hectare	Yes
2(b) Indigenous vegetation or habitat of indigenous fauna that supports one or more indigenous taxa that are threatened, at risk, data deficient or uncommon, either nationally or at the relevant ecological scale.	The site is habitat for 'Threatened' and 'At Risk' taxa such as Pateke, Australasian bittern, fernbird, banded rail, weka, kiwi, kotuku and giant bully.	Yes
2(c) The ecological site contains indigenous vegetation or an indigenous taxon that is: i. Endemic to the Northland-Auckland region; or ii. At its distributional limit within the Northland region;	 The North Island weka reaches its current northern distributional limit on Russell Peninsula.	No Yes
2(d) The ecological site contains indigenous vegetation or an association of indigenous taxa that: i. Is distinctive of a restricted occurrence; or ii. Is part of an ecological unit that occurs on an originally rare ecosystem; or iii. Is an indigenous ecosystem and vegetation type that is naturally rare or has developed as a result of an unusual environmental factor(s) that occur or are likely to occur in Northland; or iv. Is an example of nationally or regionally rare habitat as recognised in the New Zealand Marine Protected Areas Policy.	The site includes an association of indigenous taxa that is rare i.e. kiwi, weka and other 'threatened' or 'at risk' avifauna.	Yes

3. Diversity and pattern		**Yes**
3(a) Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of: i. Indigenous ecosystem or habitat types; or ii. Indigenous taxa;	 The site contains a range of habitat types typical of the landform and hydrology. The site contains a high diversity of 'threatened' or 'at risk' avifauna.	 Partially Partially
3(b) Changes in taxon composition reflecting the existence of diverse natural features or ecological gradients; or	refer to 3(c)	
3(c) Intact ecological sequences.	Sequence of estuarine and palustrine wetland types (the palustrine wetland is outside the mapped site).	Yes
4. Ecological Context		**Yes**
4(a) Provides or contributes to an important ecological linkage or network or buffering function.	The site links terrestrial, freshwater and estuarine habitats. The vegetation buffers estuarine environments from sediment runoff and terrestrial environments from storm surges, sea level rise etc and consequent erosion. "Mangroves and saltmarsh play important buffering and ecological role in estuary" (Waikino & Te Haumi SEA Assessments).	Yes
4(b) important hydrological, biological or ecological role in the functioning of riverine, lacustrine or palustrine systems.	The site plays a role in moderating discharges from the catchment, particularly during high rainfall events, and reducing sediment runoff. It has important biological and ecological roles as a habitat for suites of native fauna and flora. "Mangroves and saltmarsh play important buffering and ecological role in estuary" (Waikino & Te Haumi SEA Assessments).	Yes
4(c) important habitat for critical life history stages of indigenous fauna.	The site may be a breeding location for indigenous, migratory species of freshwater fish. It is almost certainly a migratory pathway. "Provides support for various life stages of benthic invertebrates, shorebirds and nursery for coastal fish species" (Waikino & Te Haumi SEA Assessments).	Yes

Appendix 3: Assessment of Te Wahapu Estuary & Wetlands (site of High Natural Character 08/31 and 08/32, parts of Sites Q05001 & Q05004 in Whangaruru ED).

	"Te Wahapu" Estuary & Wetlands (08/31 & 08/32)	
Criteria	**Notes**	**Criterion met?**
1. Representativeness		**Yes**
1(a) i. The site comprises largely indigenous vegetation types; and	Mangroves, saltmarsh, palustrine wetland.	Yes
ii. Is typical of what would have existed circa 1840; or	The vegetation is representative of that which would have occurred prior to 1840 on these landforms.	Yes
iii. Is represented by faunal assemblages in most of the guilds expected for the habitat type; or	Habitat for estuarine and freshwater fish and avifauna.	Yes
1(b) i. The site is a large example of indigenous vegetation or habitat of indigenous fauna, or	The site is large enough to be ecologically viable. The palustrine wetland is a relatively large example of its type.	Yes
ii. Contains a combination of landform and indigenous vegetation and habitat of indigenous fauna, that is considered a good example of its type.	The site includes a sequence of estuarine and palustrine vegetation that provides habitat for a suite of indigenous fauna (shellfish, fish and avifauna).	Yes
2. Rarity / distinctiveness		**Yes**
2(a) The ecological site comprises indigenous ecosystems or indigenous vegetation types that:		
i. Are either Acutely or Chronically Threatened land environments (now known as Category 1 and 2) associated with LENZ Level 4; or	The palustrine wetland is a Category 2 land environment.	Yes
ii. Excluding wetlands, are now less than 20% of their original extent; or	The site is a wetland	N/A
iii. Excluding man-made wetlands, are examples of the wetland classes that either otherwise trigger Appendix 5 criteria or exceed any of the following area: a) Saltmarsh greater than 0.5 hectare in area; or	>0.5 hectare of saltmarsh	Yes
b) Shallow water (lake margins and rivers) greater than 0.5 hectare in area; or c) Swamp greater than 0.4 hectare in	>6 hectares of manuka/raupo wetland.	Yes

area; or d) Bog greater than 0.2 hectare in area; or e) Wet Heathlands greater than 0.2 hectare in area; or f) Marsh; Fen; Ephemeral wetlands or Seepage / flush greater than 0.05 hectares in area.		
2(b) Indigenous vegetation or habitat of indigenous fauna that supports one or more indigenous taxa that are threatened, at risk, data deficient or uncommon, either nationally or at the relevant ecological scale.	Habitat of fernbird, kiwi, weka, Australasian bittern, pied shag, Caspian tern and banded rail.	Yes
2(c) The ecological site contains indigenous vegetation or an indigenous taxon that is: i. Endemic to the Northland-Auckland region; or ii. At its distributional limit within the Northland region;	The North Island weka reaches its current northern distributional limit on Russell Peninsula.	Yes
2(d) The ecological site contains indigenous vegetation or an association of indigenous taxa that: i. Is distinctive of a restricted occurrence; or ii. Is part of an ecological unit that occurs on an originally rare ecosystem; or iii. Is an indigenous ecosystem and vegetation type that is naturally rare or has developed as a result of an unusual environmental factor(s) that occur or are likely to occur in Northland; or iv. Is an example of nationally or regionally rare habitat as recognised in the New Zealand Marine Protected Areas Policy.	The site includes an association of indigenous taxa that is rare i.e. kiwi, weka and other 'threatened' or 'at risk' avifauna.	Yes
3. Diversity and pattern		**Yes**
3(a) Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of:		

i. Indigenous ecosystem or habitat types; or ii. Indigenous taxa;	The site contains a range of habitat types typical of the landform and hydrology. If the contiguous forest is included, the site has a high diversity of habitat types. The site contains a high diversity of 'threatened' or 'at risk' avifauna.	Partially Yes
3(b) Changes in taxon composition reflecting the existence of diverse natural features or ecological gradients; or	refer to 3(c)	
3(c) Intact ecological sequences.	Sequence of estuarine and palustrine wetland types contiguous with indigenous forest and scrub.	Yes
4. Ecological Context		**Yes**
4(a) Provides or contributes to an important ecological linkage or network or buffering function.	The site links terrestrial, freshwater and estuarine habitats. The vegetation buffers estuarine environments from sediment runoff and terrestrial environments from storm surges, sea level rise etc and consequent erosion. "Mangroves and saltmarsh play important buffering and ecological role in estuary" (Waikino & Te Haumi SEA Assessments).	Yes
4(b) important hydrological, biological or ecological role in the functioning of riverine, lacustrine or palustrine systems.	The site plays a role in moderating discharges from the catchment, particularly during high rainfall events, and reducing sediment runoff. It has important biological and ecological roles as a habitat for suites of native fauna and flora. "Mangroves and saltmarsh play important buffering and ecological role in estuary" (Waikino & Te Haumi SEA Assessments).	Yes
4(c) important habitat for critical life history stages of indigenous fauna.	The site may be a breeding location for indigenous, migratory species of freshwater fish. It is almost certainly a migratory pathway. "Provides support for various life stages of benthic invertebrates, shorebirds and nursery for coastal fish species" (Waikino & Te Haumi SEA Assessments).	Yes

Appendix 4: Assessment of Pipiroa/Okiato (Natural Character site 09/83, part of site Q05004 in Whangaruru ED).

	Pipiroa (Okiato) 09/83	
Criteria	**Notes**	**Criterion met?**
1. Representativeness		**Yes**
1(a) i. The site comprises largely indigenous vegetation types; and	Mangroves, saltmarsh and freshwater wetlands (**Natural Character assessment**).	Yes
ii. Is typical of what would have existed circa 1840; or	Indigenous vegetation with few pest plants, making progress towards present potential cover for site conditions (**Natural Character assessment**).	Yes
iii. Is represented by faunal assemblages in most of the guilds expected for the habitat type; or	Habitat for native birds, fish and invertebrates.	Yes
1(b) i. The site is a large example of indigenous vegetation or habitat of indigenous fauna, or	The site is large enough to be ecologically viable and is contiguous with other areas of indigenous vegetation.	Yes
ii. Contains a combination of landform and indigenous vegetation and habitat of indigenous fauna, that is considered a good example of its type.	Estuarine and palustrine wetlands, with forest on adjacent hillslopes, ridges and gullies.	Yes
2. Rarity / distinctiveness		**Yes**
2(a) The ecological site comprises indigenous ecosystems or indigenous vegetation types that:		
i. Are either Acutely or Chronically Threatened land environments (now known as Category 1 and 2) associated with LENZ Level 4; or	Part is Category 2 land environment.	Yes
ii. Excluding wetlands, are now less than 20% of their original extent; or		No
iii. Excluding man-made wetlands, are examples of the wetland classes that either otherwise trigger Appendix 5 criteria or exceed any of the following area: a) Saltmarsh greater than 0.5 hectare in area; or	*c.*0.6 hectares of saltmarsh	Yes
b) Shallow water (lake margins and rivers) greater than 0.5 hectare in area; or c) Swamp greater than 0.4 hectare in	2.5 hectares	Yes

area; or d) Bog greater than 0.2 hectare in area; or e) Wet Heathlands greater than 0.2 hectare in area; or f) Marsh; Fen; Ephemeral wetlands or Seepage / flush greater than 0.05 hectares in area.		
2(b) Indigenous vegetation or habitat of indigenous fauna that supports one or more indigenous taxa that are threatened, at risk, data deficient or uncommon, either nationally or at the relevant ecological scale.	Habitat of kiwi, weka, fernbird, Australasian bittern, banded rail and Auckland green gecko.	Yes
2(c) The ecological site contains indigenous vegetation or an indigenous taxon that is: i. Endemic to the Northland-Auckland region; or ii. At its distributional limit within the Northland region;	Auckland green gecko The North Island weka reaches its current northern distributional limit on Russell Peninsula.	Yes Yes
2(d) The ecological site contains indigenous vegetation or an association of indigenous taxa that: i. Is distinctive of a restricted occurrence; or ii. Is part of an ecological unit that occurs on an originally rare ecosystem; or iii. Is an indigenous ecosystem and vegetation type that is naturally rare or has developed as a result of an unusual environmental factor(s) that occur or are likely to occur in Northland; or iv. Is an example of nationally or regionally rare habitat as recognised in the New Zealand Marine Protected Areas Policy.	The site includes an association of indigenous taxa that is rare i.e. kiwi and weka.	Yes

3. Diversity and pattern		**Yes**
3(a) Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of: i. Indigenous ecosystem or habitat types; or ii. Indigenous taxa;	 The site comprises indigenous estuarine wetlands and palustrine wetlands surrounded by native forest. The site contains a diversity of 'threatened' or 'at risk' avifauna and relatively common species of fauna and flora.	 Yes Yes
3(b) Changes in taxon composition reflecting the existence of diverse natural features or ecological gradients; or	refer to 3(c)	
3(c) Intact ecological sequences.	Intact ecological sequence from estuarine vegetation to ridgetops.	Yes
4. Ecological Context		**Yes**
4(a) Provides or contributes to an important ecological linkage or network or buffering function.	The site links terrestrial, freshwater and estuarine habitats. The vegetation buffers estuarine environments from sediment runoff and terrestrial environments from storm surges, sea level rise etc and consequent erosion. "Mangroves and saltmarsh play important buffering and ecological role in estuary" (Waikino & Te Haumi SEA Assessments).	Yes
4(b) important hydrological, biological or ecological role in the functioning of riverine, lacustrine or palustrine systems.	The site plays a role in moderating discharges from the catchment, particularly during high rainfall events, and reducing sediment runoff. It has important biological and ecological roles as a habitat for suites of native fauna and flora. "Mangroves and saltmarsh play important buffering and ecological role in estuary" (Waikino & Te Haumi SEA Assessments).	Yes
4(c) important habitat for critical life history stages of indigenous fauna.	The site may be a breeding location for indigenous, migratory species of freshwater fish. It is almost certainly a migratory pathway. "Provides support for various life stages of benthic invertebrates, shorebirds and nursery for coastal fish species" (Waikino & Te Haumi SEA Assessments).	Yes

Appendix 5: Assessment of Frenchman's Swamp (Natural Character site 10/07, part of site Q05001 in Whangaruru ED).

	Frenchman's Swamp 10/07	
Criteria	**Notes**	**Criterion met?**
1. Representativeness		**Yes**
1(a) i. The site comprises largely indigenous vegetation types; and	Mangrove scrub & forest and saltmarsh with some areas of freshwater wetland further inland with pest plants (**Natural Character Assessment**).	Yes
ii. Is typical of what would have existed circa 1840; or	The vegetation is representative of that which would have occurred prior to 1840 on these landforms. Close to present potential cover for site conditions (**Natural Character Assessment**).	Yes
iii. Is represented by faunal assemblages in most of the guilds expected for the habitat type; or	Habitat for estuarine and freshwater fish, shellfish and avifauna.	Yes
1(b) i. The site is a large example of indigenous vegetation or habitat of indigenous fauna, or	The site is large enough to be ecologically viable and is contiguous with other natural areas.	Yes
ii. Contains a combination of landform and indigenous vegetation and habitat of indigenous fauna, that is considered a good example of its type.	The site is part of a continuum of marine to terrestrial ecosystems (**Natural Character Assessment**). It provides habitat for a suite of indigenous fauna (shellfish, fish and avifauna).	Yes
2. Rarity / distinctiveness		**Yes**
2(a) The ecological site comprises indigenous ecosystems or indigenous vegetation types that:		
i. Are either Acutely or Chronically Threatened land environments (now know as Category 1 and 2) associated with LENZ Level 4; or		N/A
ii. Excluding wetlands, are now less than 20% of their original extent; or	The site is a wetland	N/A
iii. Excluding man-made wetlands, are examples of the wetland classes that either otherwise trigger Appendix 5 criteria or exceed any of the following area: a) Saltmarsh greater than 0.5 hectare in	>0.5 hectare of saltmarsh	Yes

area; or b) Shallow water (lake margins and rivers) greater than 0.5 hectare in area; or c) Swamp greater than 0.4 hectare in area; or d) Bog greater than 0.2 hectare in area; or e) Wet Heathlands greater than 0.2 hectare in area; or f) Marsh; Fen; Ephemeral wetlands or Seepage / flush greater than 0.05 hectares in area.		
2(b) Indigenous vegetation or habitat of indigenous fauna that supports one or more indigenous taxa that are threatened, at risk, data deficient or uncommon, either nationally or at the relevant ecological scale.	Known habitat of fernbird and weka. Probable habitat of banded rail.	Yes
2(c) The ecological site contains indigenous vegetation or an indigenous taxon that is: i. Endemic to the Northland-Auckland region; or ii. At its distributional limit within the Northland region;	The North Island weka reaches its current northern distributional limit on Russell Peninsula.	Yes
2(d) The ecological site contains indigenous vegetation or an association of indigenous taxa that: i. Is distinctive of a restricted occurrence; or ii. Is part of an ecological unit that occurs on an originally rare ecosystem; or iii. Is an indigenous ecosystem and vegetation type that is naturally rare or has developed as a result of an unusual environmental factor(s) that occur or are likely to occur in Northland; or iv. Is an example of nationally or regionally rare habitat as recognised in the New Zealand Marine Protected Areas Policy.		

3. Diversity and pattern		**Yes**
3(a) Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of: i. Indigenous ecosystem or habitat types; or ii. Indigenous taxa;	The site comprises indigenous estuarine wetlands and palustrine wetlands. The site provides habitat for more than one 'threatened' or 'at risk' species and relatively common species of fauna and flora.	Yes Yes
3(b) Changes in taxon composition reflecting the existence of diverse natural features or ecological gradients; or	refer to 3(c)	
3(c) Intact ecological sequences.	The site is part of a continuum of marine to terrestrial ecosystems (**Natural Character Assessment**).	Yes
4. Ecological Context		**Yes**
4(a) Provides or contributes to an important ecological linkage or network or buffering function.	The site buffers estuarine environments from sediment runoff and terrestrial environments from storm surges, sea level rise etc and consequent erosion. "Mangroves and saltmarsh play important buffering and ecological role in estuary" (Waikino & Te Haumi SEA Assessments).	Yes
4(b) important hydrological, biological or ecological role in the functioning of riverine, lacustrine or palustrine systems.	The site plays a role in moderating discharges from the catchment, particularly during high rainfall events, and reducing sediment runoff. It has important biological and ecological roles as a habitat for suites of native fauna and flora. "Mangroves and saltmarsh play important buffering and ecological role in estuary" (Waikino & Te Haumi SEA Assessments).	Yes
4(c) important habitat for critical life history stages of indigenous fauna.	The site may be a breeding location for indigenous, migratory species of freshwater fish. It is almost certainly a migratory pathway. "Provides support for various life stages of benthic invertebrates, shorebirds and nursery for coastal fish species" (Waikino & Te Haumi SEA Assessments).	Yes